ENGINEERING NEWS-RECORD

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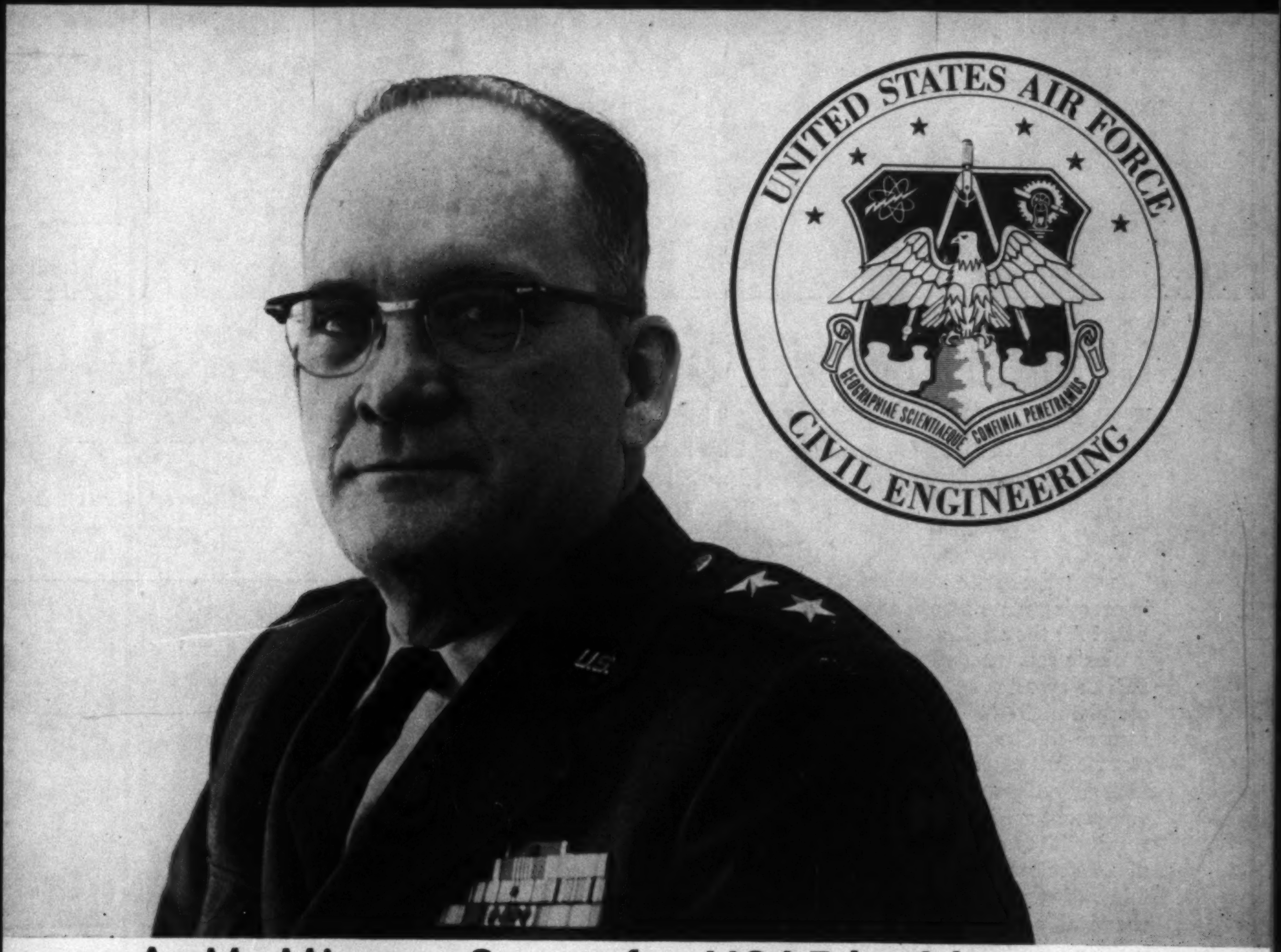
UNITED STATES AIR FORCE
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U.S.

A. M. Minton: Status for USAF builders *p.66*

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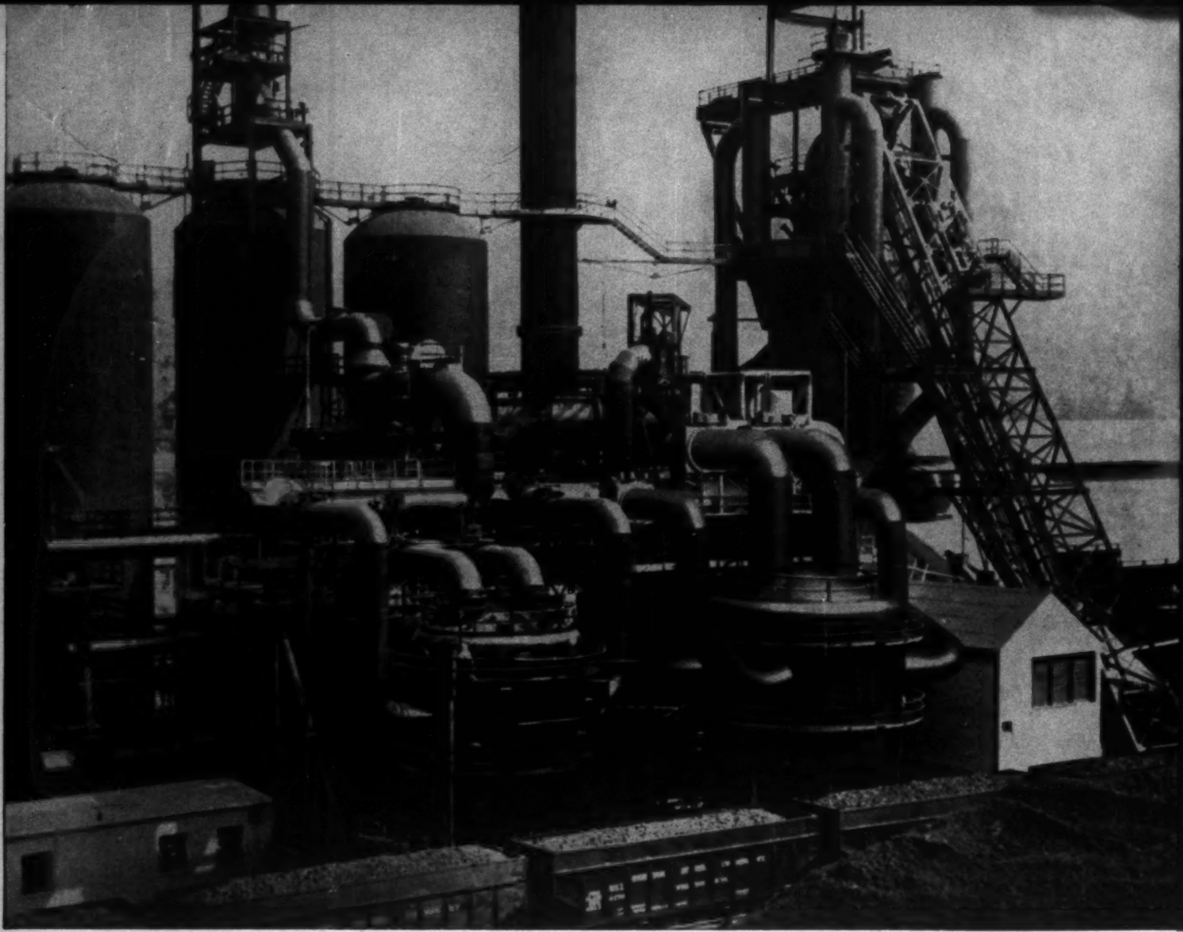

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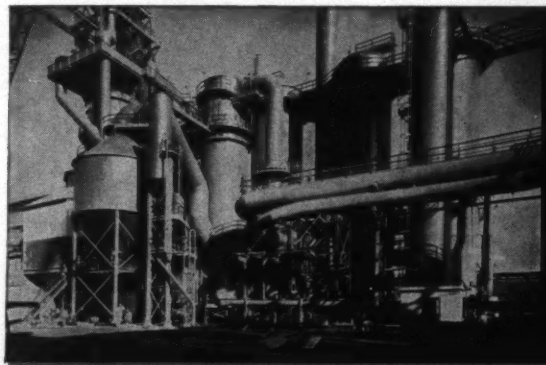
STEEL PLATE WORK

The experience of more than 65 years in exacting plate fabrication qualifies PDM for the steelmaker's large and intricate construction projects. PDM's broad resources cover the complete job—in the case of blast furnace construction, the shell, hot blast stoves, dust catcher, ducting, piping, fittings, walkways and all accessory equipment are included in a single responsibility and guarantee of satisfaction. Whether your plate fabrication requirements are in the steel, chemical, petroleum or other industries—if first-quality work is first in importance, *get a quotation from Pittsburgh-Des Moines.*



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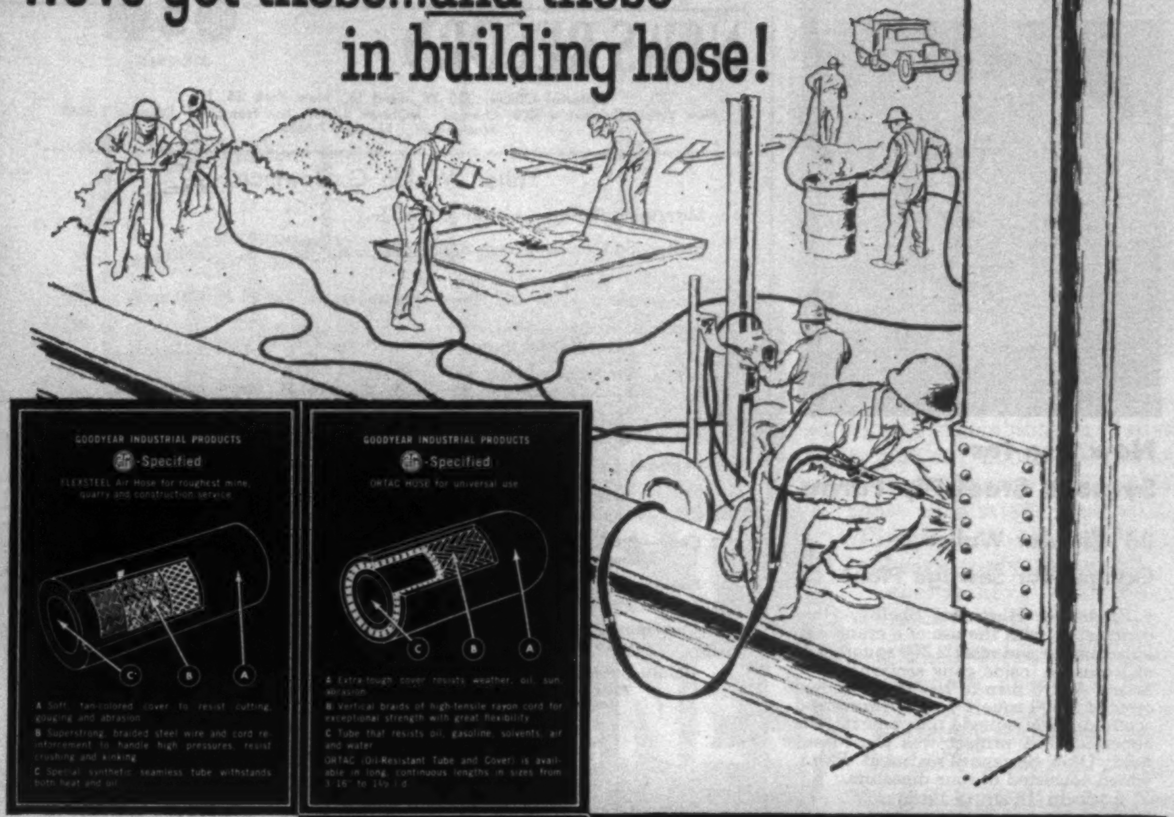
We've got these...and those in building hose!



GOODYEAR INDUSTRIAL PRODUCTS

-Specified

FLEXSTEEL Air Hose for roughest mine, quarry and construction service

A Soft, tan-colored cover to resist cutting, gouging and abrasion

B Superstrong, braided steel wire and cord reinforcement to handle high pressures, resist crushing and kinking

C Special synthetic seamless tube withstands both heat and oil

GOODYEAR INDUSTRIAL PRODUCTS

-Specified

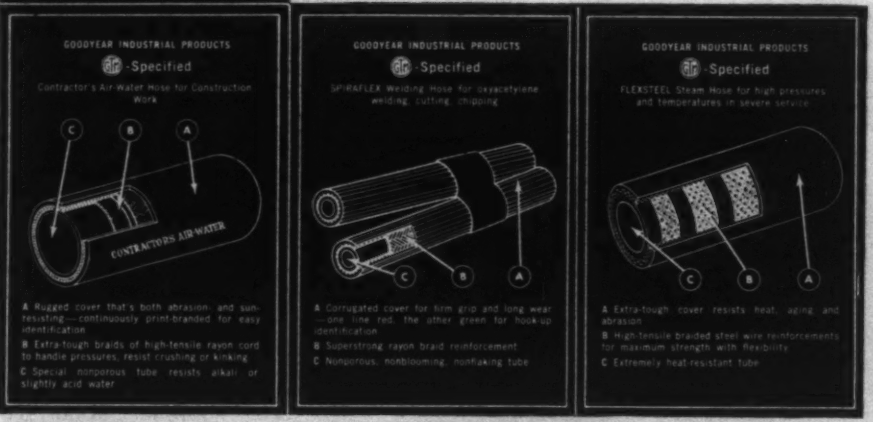
ORTAC HOSE for universal use

A Extra-tough cover resists weather, oil, sun, abrasion

B Vertical braids of high-tensile rayon cord for exceptional strength with great flexibility

C Tube that resists oil, gasoline, solvents, air and water

ORTAC (Oil-Resistant Tube and Cover) is available in long, continuous lengths in sizes from 3/16" to 1½ i.d.



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Contractor's Air-Water Hose for Construction Work

A Rugged cover that's both abrasion- and sun-resisting—continuously print-branded for easy identification

B Extra-tough braids of high-tensile rayon cord to handle pressures, resist crushing or kinking

C Special nonporous tube resists alkali or slightly acid water

GOODYEAR INDUSTRIAL PRODUCTS

-Specified

SPIRAFLEX Welding Hose for oxyacetylene welding, cutting, chipping

A Corrugated cover for firm grip and long wear—one line red, the other green for hook-up identification

B Superstrong rayon braid reinforcement

C Nonporous, nonblooming, nonflaking tube

GOODYEAR INDUSTRIAL PRODUCTS

-Specified

FLEXSTEEL Steam Hose for high pressures and temperatures in severe service

A Extra-tough cover resists heat, aging and abrasion

B High-tensile braided steel wire reinforcements for maximum strength with flexibility

C Extremely heat-resistant tube

HIGH pressure or low—for air, water, steam, oil or gas—the smart choice in hose is Goodyear.

For Goodyear hose is built for builders: Its cover is super-tough to resist rough handling. It's heavily muscled with high-tensile cord or steel reinforcements. It resists kinking or crushing. Yet it's flexible and easy to maneuver.

Wouldn't it pay you, then, to insist on Goodyear quality on your next hose-using job? Check with your Goodyear Distributor for details on the special line that's designed to meet every contracting need. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

IT'S SMART TO DO BUSINESS with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."

the big name in hose is

GOODYEAR

Flexsteel, Ortac, Spiraflex—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

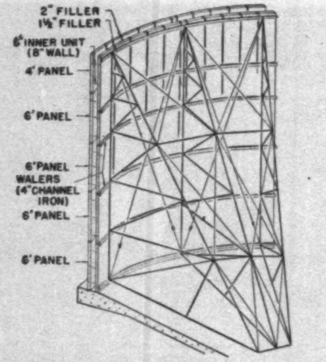
THE GREATEST NAME IN RUBBER

Weight 4 Tons

New Use for Symons Steel-Ply Forms

28′ Circular Walls Ganged for Sewage Plant

Friebel & Hartman, Shelby, Ohio contractor, with the use of a crane was able to strip and reset 2,300 square feet of forms on inside gang section in 3½ hours. And 8 men in less than 8 hours erected 2,300 square feet of forms and scaffolding on outside plus pouring the concrete. The project was the Mansfield, Ohio Sewage Treatment Plant, which consisted of four digestors.



Four ganged sections were used—each 22 feet wide and 28 feet high. This allowed pouring ⅓ of a tank at a time, and a pour every four working days. Weight of each ganged form was about four tons. A ¾ yard Lorain with an 80′ boom handled the sections.

Complete story on the Ohio Sewage Treatment Plant will be sent FREE upon request. Symons Forms may be rented with purchase option.

Symons

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EIGHTY-SIXTH YEAR OF PUBLICATION

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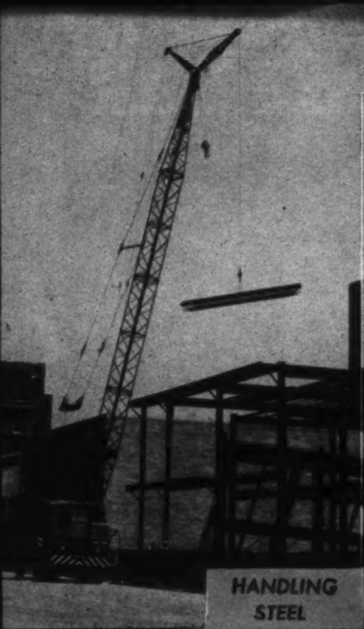
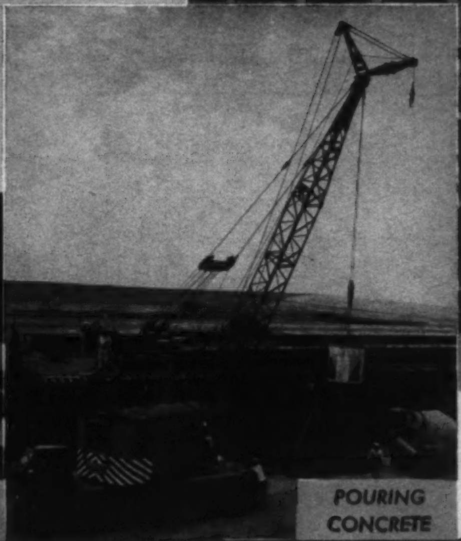


HANDLING STEEL



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Money Makers on jobs like these!

● Northwest Truck Cranes bring you the greatest combination of advantages ever put on rubber. They mean time saved and money made on jobs like those illustrated. Northwest Truck Cranes, like all Northwests, are always ready to go. *We hear it everywhere and Northwest owners will tell you so.*

Their greater flexibility, their smooth operation with long booms, their greater dependability reduces time losses and speeds the job over ordinary equipment.

You can't know all about a Northwest unless you have had one. Bring yourself up to date on Northwests newer features. Ask to see a Northwest Man.

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NORTHWEST *Always Ready to* GO

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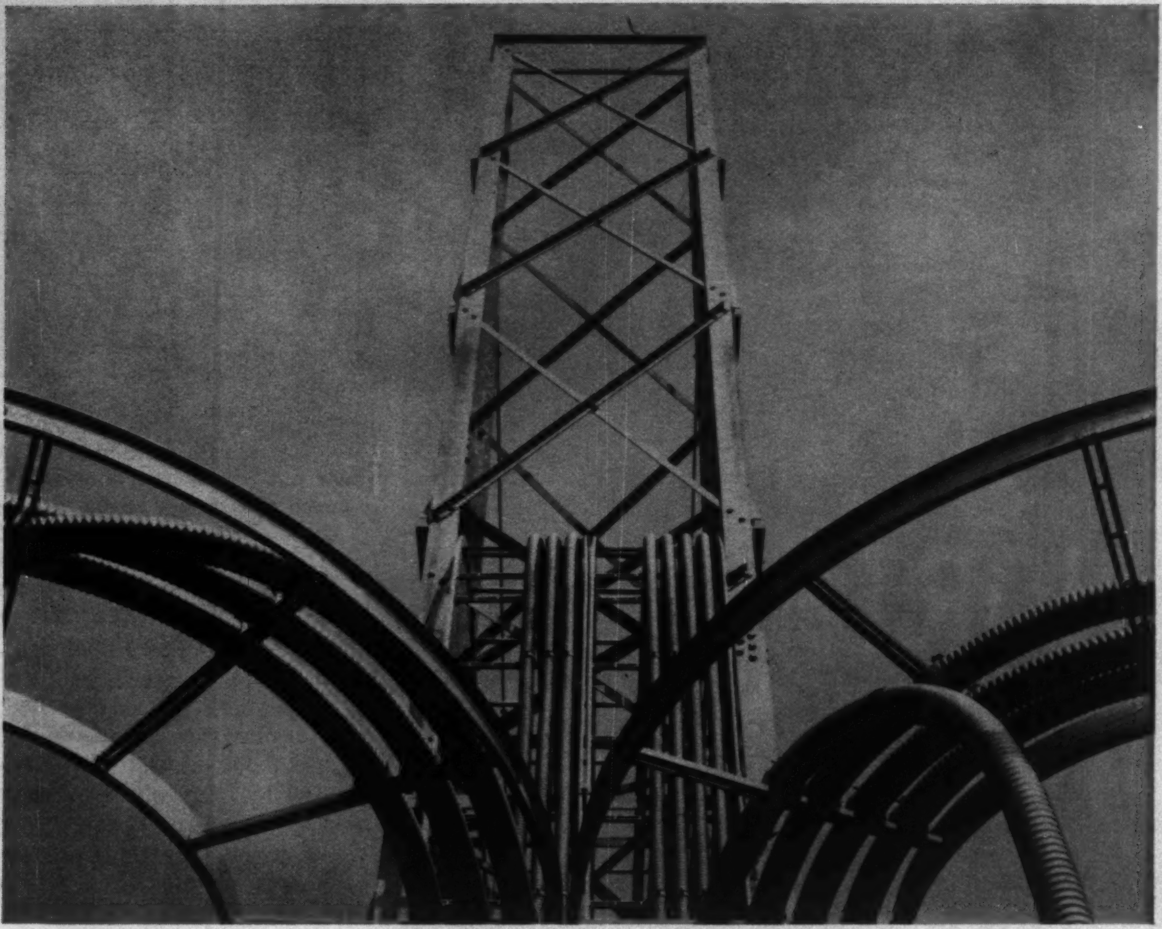

BRIDGE ON THE RIVER KVA

6,242,800,000,000,000,000 electrons have to pass a given point in one of those conduits —*in one second*— to convey just one amp of electricity to its work. Think what a torrent of energy is seething at the base of this catenary. There isn't enough space on this page to show you how many electrons rush through its cables in a few minutes to the vast plant beyond.

Lord Electric Company has been setting up electrical systems to generate, convey, control and use this indescribable energy for over sixty-five years.

A nation-wide organization, Lord has ready access to large reserves of top-flight electrical experts anywhere in the U. S.

Experience, personnel, financial strength, and an unsurpassed record of performance enable us to undertake your electrical installation promptly, and to expedite its completion. Your inquiry will receive immediate attention.

LORD
ELECTRIC COMPANY, INC.
Electrical Contractors to the Nation Since 1895

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Longer, stronger AMVIT Jointed Clay Pipe never gets too soft to take it

"Readily Cut by Handsaw," say ads for many non-clay substitute pipes. If they're that soft, they can't stand up in tough sewer service.

This is an actual photograph of substitute pipe installed in violation of code.

The photograph on the right shows a piece of fibre sewer pipe installed by a handyman who beveled it with a jackknife.

Pipe this soft sags under backfill, damages easily and will soften and flatten out of round. They become scratched and roughened. Rodents and termites will gnaw away wrappings and coatings of composition pipe.

Amvit Jointed Clay Pipe never gets too soft to take it. It's strong and rigid, can't sag or bend. The plastic joint, like the pipe, is acid resistant. And, roots cannot enter this tight compression joint.

Acid-laden, high temperature sewage, discharged from washing machines and garbage disposal units will not bother Amvit Jointed Clay Pipe in any way. Neither will the abrasive action of sand or gravel.

For more information on how Amvit can help cut sewer project costs, write or call American Vitrified Products Company, National City Bank Building, Cleveland, Ohio, or our office nearest you.

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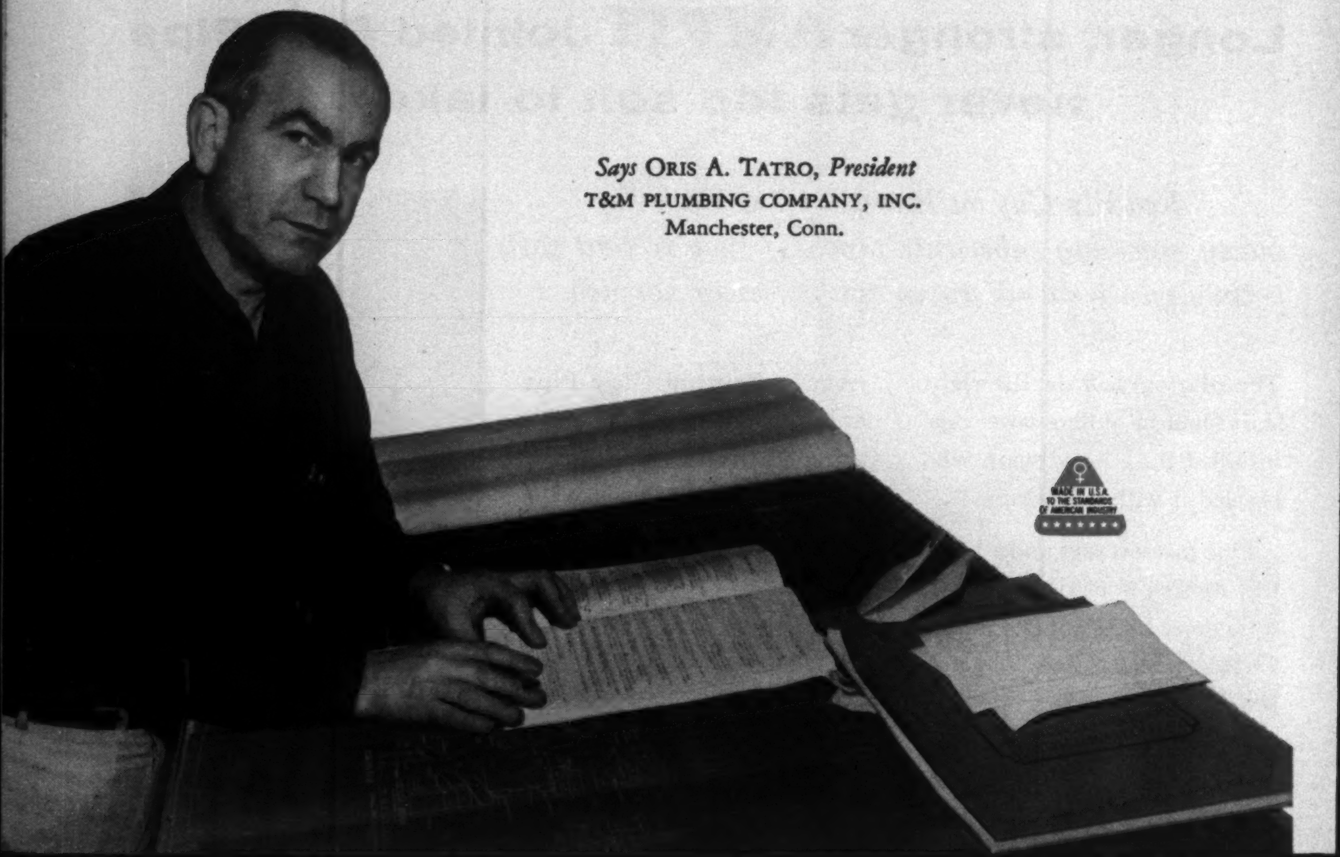

Says Oris A. Tatro, *President*
T&M PLUMBING COMPANY, INC.
Manchester, Conn.

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

"Copper DWV Lines make possible a quality job at No Extra Cost...

While grease test proves copper best . . . stoppage nil"

Continued Mr. Tatro, "If you have any doubts as to the quality of the job you can turn out with DWV copper water tube for the same amount of money as rustable lines, you should have seen the Capehart Housing Project at Ft. Monmouth, N. J.

"We would have been able to show you how men, with practically no experience in working with copper tube on the job site, or prefabricating it in the shop, were able to turn out the best quality job possible at the same price as rustable material.

"The pictures shown here can tell you better than I the many time-saving advantages of working with DWV. And speaking of DWV I'd like to point out one thing: after ten years with copper, we have found stoppage of kitchen sinks, where copper drainage lines had been used, to be nil. Make the test shown at right; you'll soon see why.

"Another thing I'd like to add: a copper installation is made to last, and it does."

You, too, will find that it costs no more (often less) to install a 100% copper job, than it does to use rustable pipe.

Engineers, contractors, home builders and architects have also found that copper water tube is equally important for use in air conditioning lines, radiant panel heating, oil burner and processing lines. It's also important that you specify a particular brand . . . Revere—oldest name in copper.

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Founded by Paul Revere in 1801
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Mills: Rome, N. Y.; Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles, Riverside and Santa Ana, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities. Distributors Everywhere.

PICTURES TELL THE MONEY-SAVING STORY OF REVERE COPPER WATER TUBE & DWV

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1. CAPEHART HOUSING PROJECT—U S. Army Base, Ft. Monmouth, N.J., where 27,320 ft. of Revere Copper Water Tube were used for hot and cold water lines, drainage, waste and vent lines, in 130 units, 33 buildings.

2. SHOP PREFABRICATION—means non-leak joints under ideal working conditions with jigs speeding up operations and making multiple bends a cinch. Saves installation time.

3. DWV "TREES" can be prefabricated too, because even the long lengths are so light one man can handle with ease.

4. ONE MAN and a pick-up truck can load and unload all the materials and prefabricated sections needed for a full day's work, in a matter of minutes.

5. 2 PLUMBERS and a helper, in one day, installed all the plumbing and drainage lines to complete 2 houses a day, each building having 4 apartments. Think of all the time involved if threaded pipe and fittings had been used.

6. WITH prefabricated sections, plumbing and DWV lines can be roughed in at the same time framing is put in place.

7. GREASE TEST PROVES COPPER DOES NOT CLOG as does rustable pipe. Both copper and ferrous pipe (2") were lined with 3 oz. of lard. Then, 140° F. water was run through both simultaneously using a "Y" fitting. The lard left the copper tube within 8 seconds due to high conductivity of copper, the low mass and its gun-barrel smoothness . . . with no trace of residue. It took 29 seconds for the lard to leave the ferrous pipe. Note residue. It doesn't take long for grease to pile up in amounts sufficient to cause clogging when drainage lines are ferrous pipe. Photos are unretouched. Arrow points to lard leaving copper tube.

• • • •

General Contractor: B. J. LUCARELLI, Newark, N. J.
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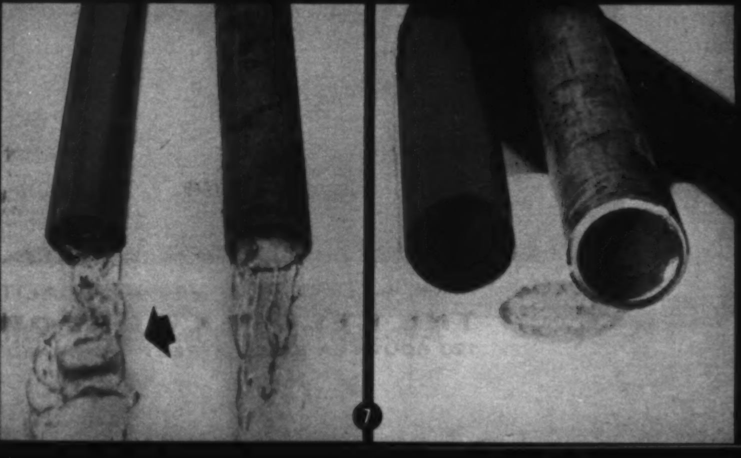

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NON-EXTRUDING FIBER EXPANSION JOINT

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25 years of job-proved performance have made Flexcell Board "1st Choice Across America!" Resilient, yet tough, rigid, non-extruding... dimensionally stable. Water-resistant. Not affected by heat or cold. Economical, efficient, easy-to-use!

Your Flexcell Distributor is equipped to fabricate shapes and strips to your specifications. Call him, or write for samples!

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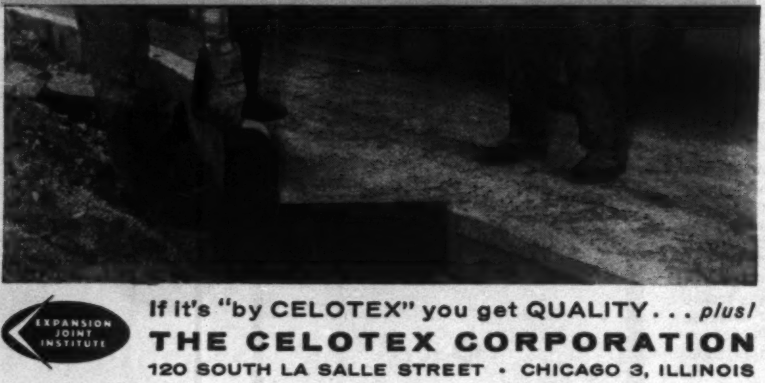
CELOTEX
PRODUCT

"Saves time, cuts waste"

says Columbus, Ohio Builder of North/South Freeway stretch. "We like the way Flexcell comes in right-and-ready shape and form," says J. A. Chapman, project manager for Visintine Construction Company. "We prefer Flexcell joint material for pavement and around curbings," he adds. "It comes cut-to-shape, accurately punched, ready to store for use as needed."



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If it's "by CELOTEX" you get QUALITY... *plus!*
THE CELOTEX CORPORATION
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Reader Comment

Computers

SIR—Of the dozens of articles and reports on computers that I have read during the past five years, the one by Frederick S. Merritt in your Apr. 14 issue is the most comprehensive and easily read. I want to circulate it among the engineers in my department.

L. B. TRENHOLME
Superintendent of Engineering
Union Carbide Chemicals Co.
Texas City, Tex.

SIR—We would appreciate receiving reprints of your computer article in the Apr. 14 issue. This particular edition was most timely in stimulating interest in this area among structural engineers.

J. M. ENGLISH
Vice-Chairman, Research
Department of Engineering
University of California
Los Angeles

SIR—As a reader of ENGINEERING RECORD since 1904 and ENGINEERING NEWS since 1905, I resent usurping valuable readers' space (for which we pay $6.00 a year) with a long article on computers in the Apr. 14 issue. Purchasing departments are available to dig up such stuff at the proper time. I'll wager not 0.2% of your readers (perhaps 200) are a bit interested in such an article; even with cartoons a la New Yorker.

CLINTON L. BOGERT
Clinton Bogert Engineers
New York, N. Y.

SIR—For years I have received the ENGINEERING NEWS-RECORD. Your special report on computers is splendid. I should like several reprints for associates.

EDWARD R. PEARSON
Office of Chief of Engineers,
U. S. Army
Washington, D. C.

SIR—I enjoyed the article on computers and would like five or six reprints. Unless one is actually in the business of using computers, there is an aura of mystery connected with them. Your article gives a very clear picture of the over-all. This is a quick way to gain perspective. Many thanks.

C. F. SAVAGE, CONSULTANT
Engineering Professional Relations
General Electric Co.
New York, N. Y.

(Reader Comment continued p. 11)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed, Editor Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

ACID-RESISTANT, WATER-TIGHT, QUICK-COUPLING JOINTS

for straight and offset concrete sewer pipe

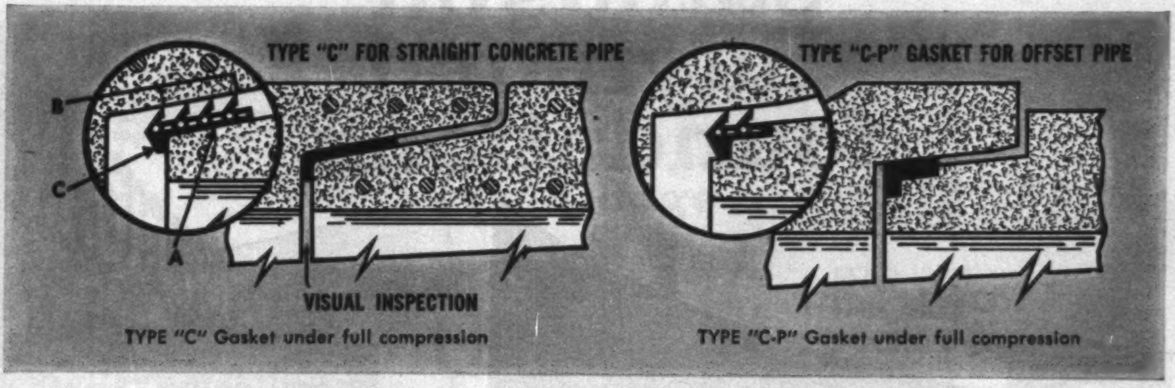
with TYLOX®

"C" SERIES flexible GASKETS

Sanitary Engineers can take advantage of the matchless efficiency of TYLOX Flexible Gaskets for coupling *any* concrete pipe sewer they design . . . because there's a specially designed TYLOX cross-section for *any type* of concrete pipe!

Type "C" Gaskets for straight, and type "C-P" Gaskets for offset pipe, provide the same high performance features you are accustomed to in famous Type "A" Gaskets . . . PLUS a visual inspection feature made possible by a flange which overhangs the edge of the pipe tongue, or tongue offset, according to the type of pipe. On pipe large enough to admit workmen, proof of correct gasket positioning can be obtained by noting whether the inspection flange is evenly seated around the entire circumference of the joint. The larger the pipe, the more important this visual inspection feature becomes.

TYLOX "C" Series Gaskets are made for all pipe sizes, handle head pressures up to 50-feet, and are available in either rubber or neoprene. They may be applied to pipe at the pipe manufacturer's plant, or at the job site. Like all TYLOX Gaskets, they are immune to sewerage and industrial waste acids, and keep joints *water-tight* for the life of the pipe itself.


TYPE "C" FOR STRAIGHT CONCRETE PIPE
B
C
A
VISUAL INSPECTION
TYPE "C-P" GASKET FOR OFFSET PIPE

TYPE "C" Gasket under full compression

TYPE "C-P" Gasket under full compression

"C" Series TYLOX Gaskets consist of base A; sealing fins B; and inspection flange C. In addition to providing the inspection feature, the "locking" effect of the flange holds Gasket in true position as pipe is coupled. Design of the sealing fins is such that horizontal end-thrust forces causing "kickback" in some couplings, are eliminated in Tylox "C" Series Gaskets, assuring full seating and true alignment of pipe.

5147

Specify TYLOX

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Fully illustrated literature contains engineering data and installation information. Get it for your files. See why there are more TYLOX Gaskets specified for low head service than all other types of gaskets combined. Specify TYLOX Flexible Gaskets for jointing your waste disposal pipe lines.

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A sensational, block-long stained glass facade distinguishes American Airlines' new terminal at New York's International Airport. Designed in the "customer-centered" concept, it includes such conveniences as covered jetways that move from lounge to liner, split-level construction to promote smooth flow of traffic, restaurant and bar facilities, and private dressing rooms and showers for passengers. A complex machine in itself, this terminal rises on a foundation of 1635 Raymond step-taper, standard and wood piles. On thousands of projects huge and small, Raymond plays a vital though unseen role in linking the nation together. Ground-bound and prosaic indeed, Raymond foundations support many of the finest structures in America's communications network. Whether or not your next project presents any special foundation problems, and regardless of its nature or size, we shall be happy to consult with you.

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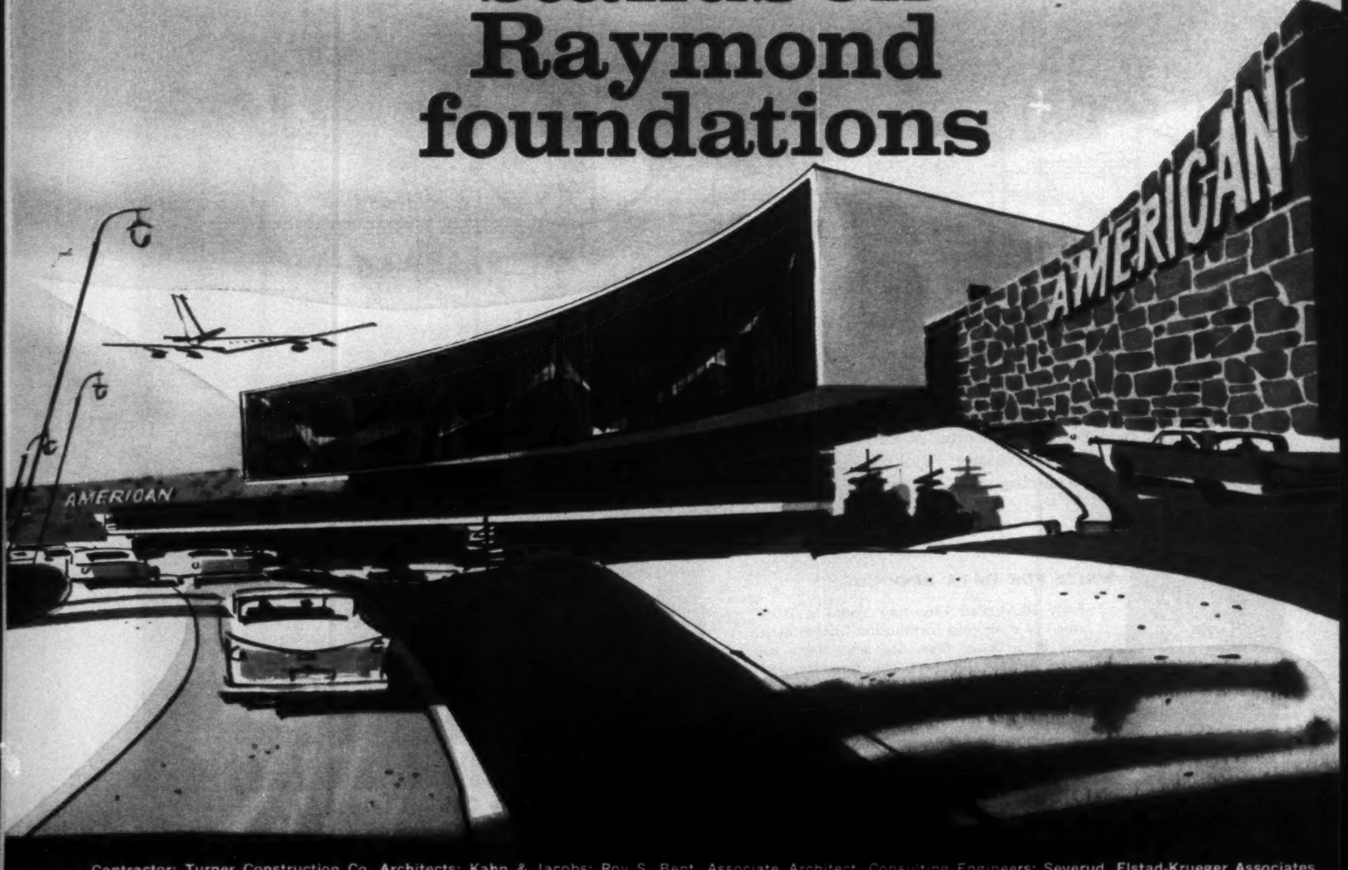
Foundations for the Structures of America•Complete Construction Services Abroad

New jet air terminal stands on Raymond foundations



Contractor: Turner Construction Co. Architects: Kahn & Jacobs; Roy S. Bent, Associate Architect. Consulting Engineers: Severud, Elstad-Krueger Associates.

. . . Reader Comment

SIR—Your article on computers provides a very fine introduction to this new and important engineering tool. I have enjoyed reading it immensely. Congratulations on a very fine piece of work.

I am working with a select group of cadets and intend to introduce them to computers and to some of the simple programming problems. Is it possible to obtain thirty copies for this educational purpose?

CHARLES H. SCHILLING
Colonel, USA, Professor
U. S. Military Academy
West Point, N. Y.

SIR—Your special report on computers was extremely well done. As West Coast representatives for Jacoby & Associates (offering a national computer service for engineers), we know from front-line experience that the transition to computer use is a problem of education and attitude: being willing to try a new tool, learning how to use it, and changing present modus operandi if electronic computation dictates.

In the field of subdivision calculations, our studies based on our fees indicate that a civil engineering firm would have to process over 800 nonrectangular lots per month to justify a computer in its office as compared to a computer service. As compared to manual calculations the computer offers greater accuracy, lower cost and greater speed.

For its well-researched and educational report ENR deserves high praise indeed. In giving your readers what they want to read you have helped advance the engineering fraternity to truly professional status.

RICHARD C. GERKE
Richard C. Gerke & Associates
Pasadena, Calif.

For your calendar . . .

American Society of Civil Engineers, national convention, Reno, Nev., June 20-24. Write: Don P. Reynolds, 33 W. 39th St., New York 18, N. Y.

Symposium on Water Quality Measurement and Instrumentation, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, Aug. 29-31. Write Director, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

Second National Conference on Electronic Computation, American Society of Civil Engineers, Pittsburgh Hilton Hotel, Pittsburgh, Pa., Sept. 8-9. Write: Wilfred Bauknight, Corps of Engineers, 925 New Federal Building, Pittsburgh 19, Pa.

Institute of Traffic Engineers, annual meeting, Edgewater Beach Hotel, Chicago, Ill., Sept. 11-15. Write: Institute of Traffic Engineers, 2029 K St. N.W., Washington 6, D. C.

American Welding Society, fall meeting, Penn-Sheraton Hotel Pittsburgh Pa., Sept. 26-29. Write: American Welding Society, 33 W. 39th St., New York 18.

Prestressed Concrete Institute, annual convention, Statler-Hilton Hotel, New York City, Sept. 27-30. Write: Norman Scott, Executive Secretary, Prestressed Concrete Institute, 205 W. Wacker Drive, Chicago 6, Ill.

American Society for Metals, 42nd National Metal Exposition & Congress, Trade and Convention Center, Philadelphia, Pa., Oct. 17-21. Write: Chester L. Wells, Exposition Manager, American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

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Address________________________
City____________ Zone______ State______

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BIGGEST SAVINGS

Allis-Chalmers boosts work hours, cuts costs with the best tractor undercarriage in the business. You get industry's toughest track...best designed track guards ... certified, permanently lubricated truck wheels, idlers, support rollers.

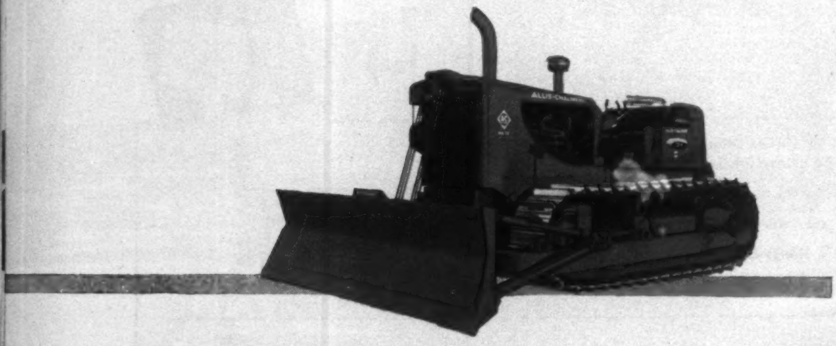
Next time you watch track shoes squeal and grind against jagged rock . . . or see 'em buried sprocket-deep in mud, consider this: Nothing slugs it out with tough conditions like an Allis-Chalmers tractor undercarriage.

Specially heat-treated track shoes, side bars, track pins and bushings are the industry's toughest. Bushings extend into counterbored side bars to seal out dirt, provide more bearing area.

Track guiding truck wheel guards provide a deep-flanged guide channel that keeps track riding true on sprockets, idlers and truck wheels even in the roughest and toughest going. The solid A-frame holds the truck frames in absolute alignment — keeps track running straight.

PERMA-SAFE truck wheels, idlers and support rollers on all Allis-Chalmers tractors roll on tapered roller bearings, are protected against dirt and moisture by Positive Seals. Factory-lubricated, they're certified never to need further greasing.

We invite a maintenance cost comparison with any other tractor undercarriage. We further invite you to inspect the Allis-Chalmers healthy, long-lived tractor engine, the all-steel main frame, double-reduction final drives and many other cost-cutting features. Your Allis-Chalmers dealer will be happy to give you full details. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



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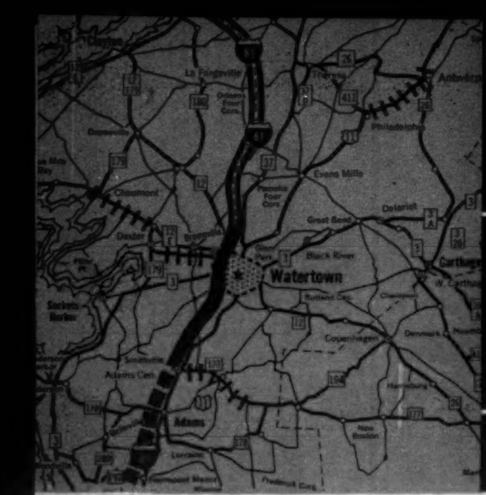
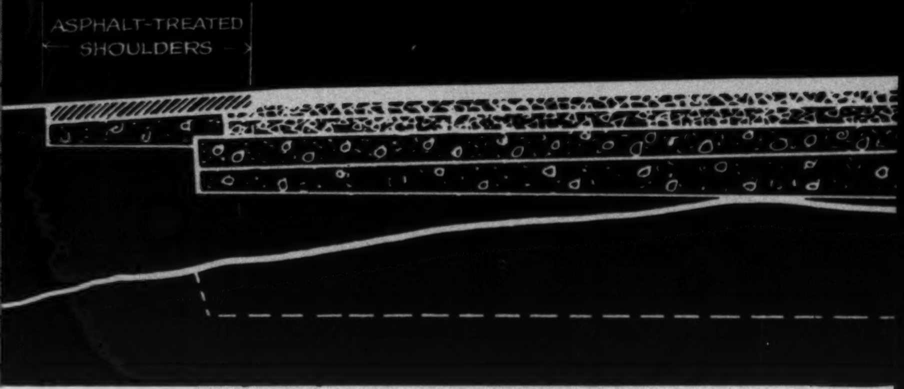
ALLIS-CHALMERS A-C

power for a growing world

21



Map shows location of Interstate #81 in Watertown area.



Cross-section diagram shows composition of single 24-foot roadway on four-lane Interstate & Defense Highway #81. Note Asphalt-treated shoulders.

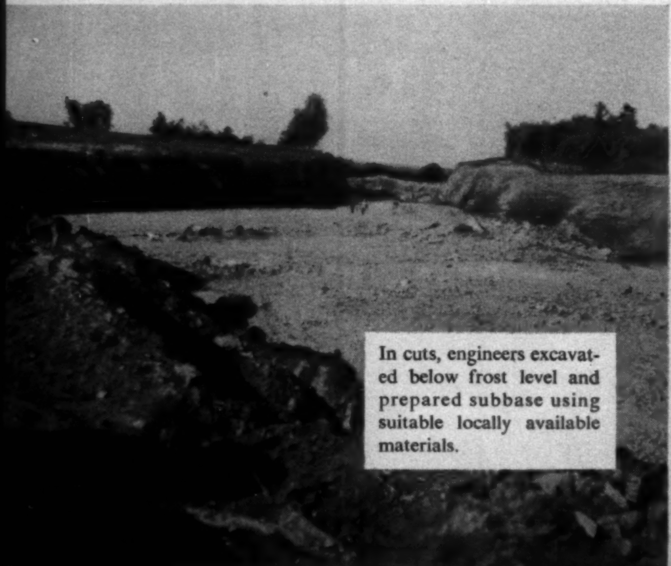
Look what they're doing with DEEP STRENGTH Asphalt Pavement in Upstate New York!

Advanced Asphalt Pavement design, over prepared subbase, solves problems in area where frost depth goes to 48 inches

Boulder-strewn glacial till near Watertown presented New York State Highway Department engineers with unusual problems. Here, winter temperatures often reach 20° to 25° *below* zero. The frost depth extends to 48 inches. In cuts, severe frost action sometimes forces boulders *through* the pavement with subsequent break-up and failure.

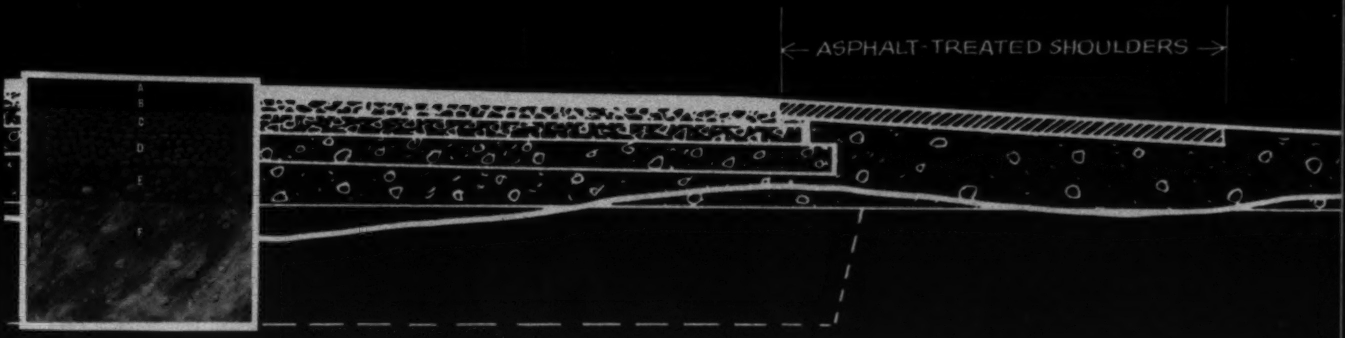
The cross-section and diagram on this page show how DEEP STRENGTH Asphalt pavement design solved the problems. Notice how the precepts of new DEEP STRENGTH Asphalt design are carried out. They include Asphalt base, Asphalt-treated shoulders, depressed median for good drainage and flat slope embankments for better safety. Capillary moisture action and frost damage are prevented by building the road structure with selected materials.

When designed like this—for DEEP STRENGTH—Asphalt pavements will carry the heaviest traffic loads without distress . . . with minimum maintenance cost. For example, the DEEP STRENGTH Asphalt-paved New Jersey Turnpike carried over 46 *million* vehicles during 1959.



In cuts, engineers excavated below frost level and prepared subbase using suitable locally available materials.

A 2½-inch Asphalt top course is applied over 3-inch plant-mixed Asphalt base and a 4-inch broken stone bottom course.



SAVE MONEY, TOO! Modern low-maintenance DEEP STRENGTH Asphalt pavements often cost *less* to build than Asphalt pavements designed to other standards. That's because the Advanced Design Criteria often permit Asphalt base to be substituted for some of the more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

NEW HANDBOOK . . . a new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt Construction soon will be available at the Asphalt Institute office serving your area.

ASPHALT HANDBOOK
THE ASPHALT INSTITUTE

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College Park, Maryland

THIS IS DEEP STRENGTH

A
2½-inch Asphalt concrete surface course

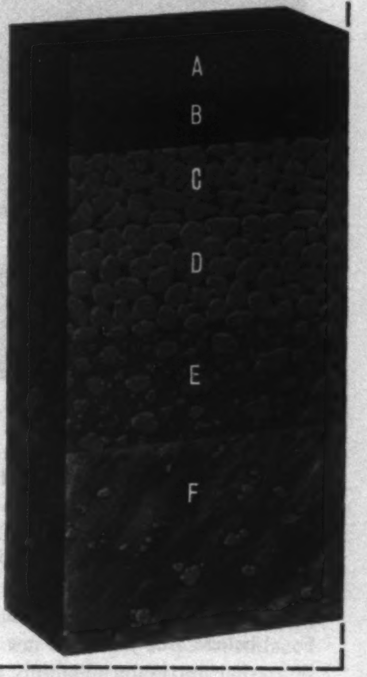
B
3-inch Asphalt base course

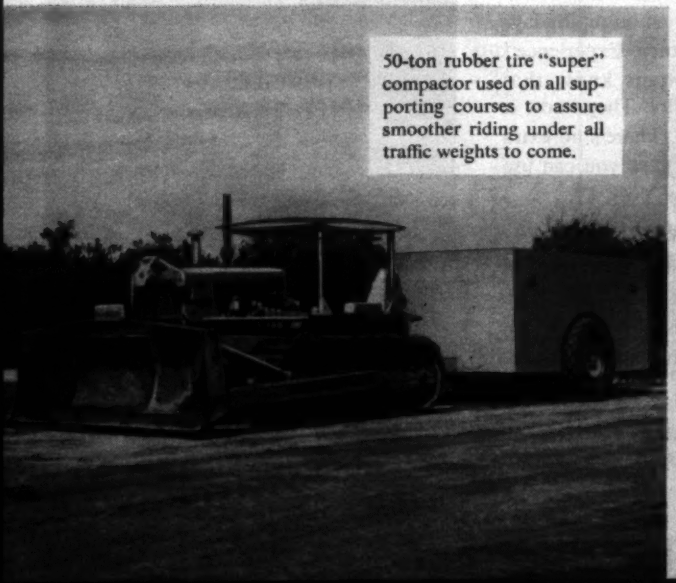
C
4-inch base course of broken stone

D
6-inch graded gravel subbase

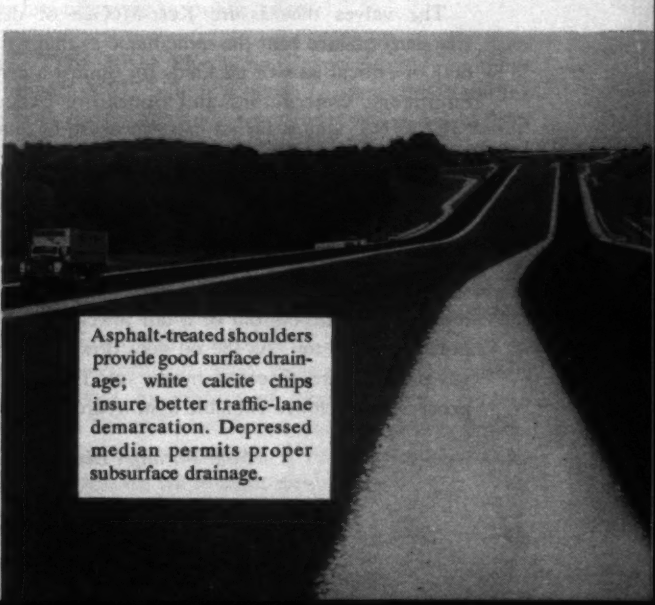
E
6-inch bank-run gravel foundation course

F
Excavated to 48 inches below pavement grade in cuts—locally available backfill material compacted with "super" compactor.

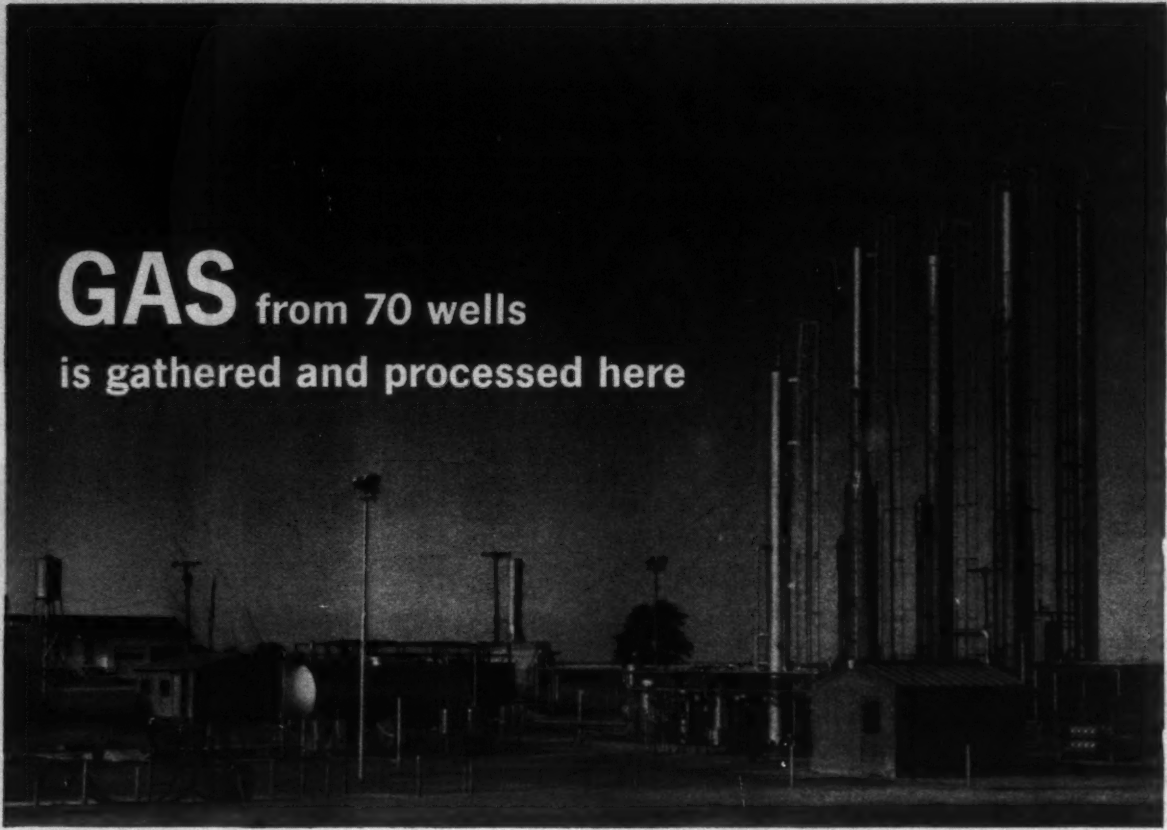




50-ton rubber tire "super" compactor used on all supporting courses to assure smoother riding under all traffic weights to come.



Asphalt-treated shoulders provide good surface drainage; white calcite chips insure better traffic-lane demarcation. Depressed median permits proper subsurface drainage.



GAS from 70 wells is gathered and processed here

"JENKINS valves give us the dependable performance our operations demand."

— states Kerr-McGee Oil Industries, Inc., Oklahoma gas producer

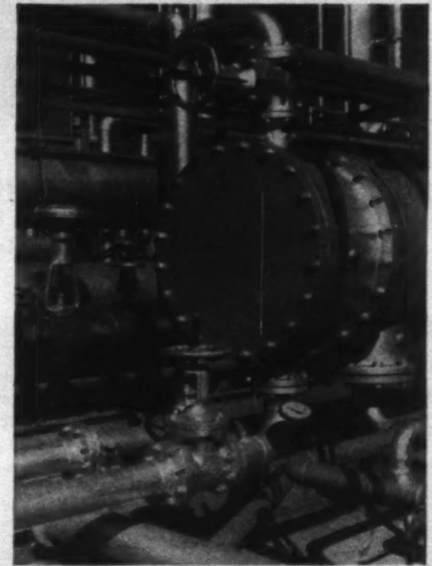
How Kerr-McGee's field processing plant in Lincoln County, Oklahoma, gathers and extracts valuable hydrocarbons from gas before delivering it to the consumer is an interesting story, briefly told below. But you need not know the process to appreciate the fact that maximum reliability in valves is a "must".

The valves that assure Kerr-McGee of dependable, trouble-free performance bear the same name as that written on piping layouts of critical jobs of all kinds for almost a century. Experienced engineers, contractors and operating executives know that "JENKINS" stands for an extra-measure of quality. They know it is the best guarantee of long, trouble-free service. There's no extra cost attached to this specification for extra quality, so you can use it for any job. Jenkins Bros., 100 Park Ave., New York 17.

HOW THE GAS PROCESSING PLANT WORKS...

Because it is a vapor at low pressure, gas is first compressed and injected into the bottom of a tall tower, called an absorber; oil is injected at the top. As the oil goes down, the gas goes up . . . the gas products are absorbed by the oil. The gas enriched oil is then processed to remove valuable light hydrocarbons.

Sold Through Leading Distributors Everywhere



Jenkins Gate Valves on lean oil cooler to the absorber

JENKINS

LOOK FOR THE JENKINS DIAMOND

JENKINS

SINCE 1864

Jenkins Bros

VALVES

ENGINEERING NEWS-RECORD

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Back Issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

BEATING BLATNIK TO THE PUNCH?—The Georgia Highway Department has blown the whistle on one of its inspectors for failing to catch a defective paving job before the work was completed. The state attorney general immediately ruled that the prime contractor was financially liable, to the tune of some $48,000. (For more on Interstate probes, see p. 26.)

DAM GATE BLENDS WATER—Warm water from the top and cold water from the bottom will be mixed to a temperature fish like in the conservation releases from the Bureau of Reclamation's Whiskeytown Dam, to be built near Redding, Calif. Water from the top and bottom intakes, upstream from the dam, will flow out through a single control gate.

CHEAP AT TWICE THE PRICE—Production cost for machine-made precast concrete railway ties will be about $9 each, or about twice the selling price of wood ties. But the machine's developer, American Concrete Crosstie Corp. of Tampa, Fla. (ENR Mar. 10, p. 26), says the price differential is offset by these concrete advantages: Ties can be spaced farther apart; and they're more durable.

CURB YOUR CRANE—New York City authorities are campaigning against traffic-blocking street obstructions, principally utility excavations and building erection cranes that occupy more than the permissible 10 ft from the curb. To set an example the city will cover all of its own street openings when workmen are not on the job.

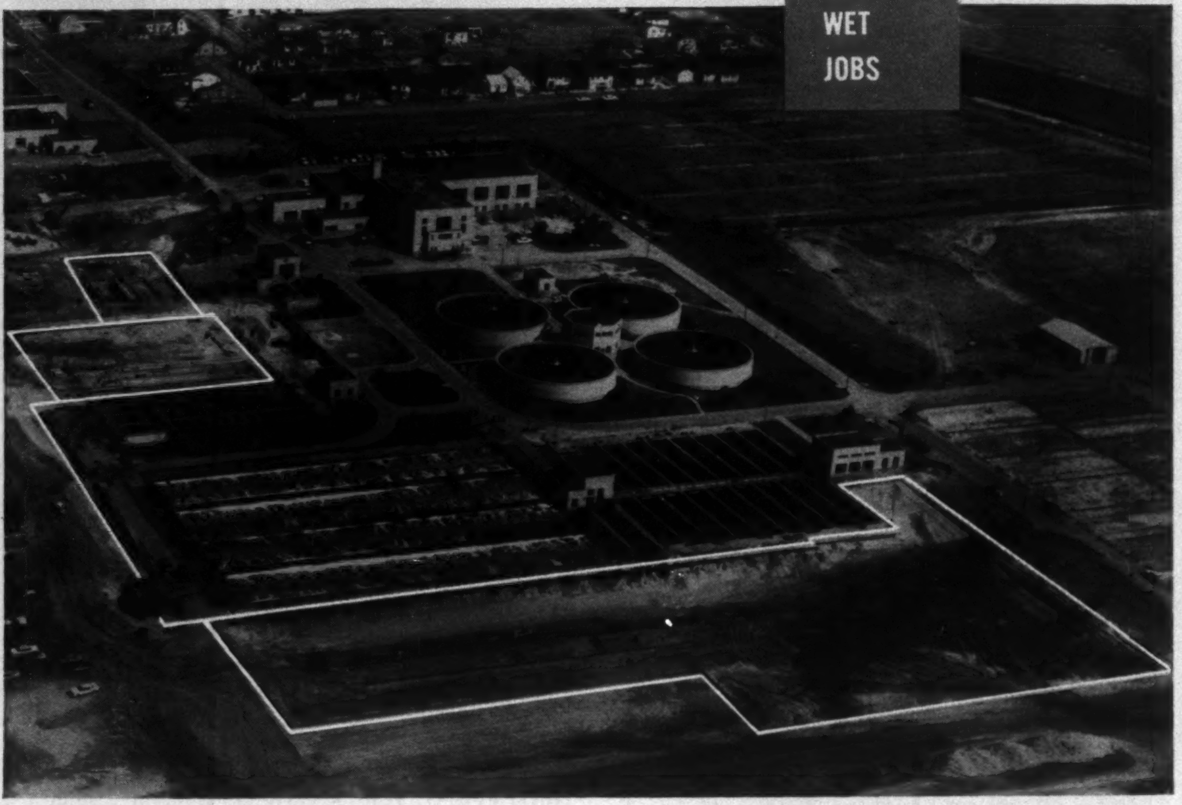
BAD FORM, YOU KNOW—London's Piccadilly Circus will not look like Times Square after all. Plans for a 13-story building with a convex front for large advertising signs have been rejected by the British government, which suggests that a plane-surfaced building with more modest advertising space would be less offensive to public taste.

SINK THE RED SEA?—An Egyptian oceanographer proposes a $15-billion scheme to dam the Red Sea at both ends. After two years, evaporation would drop sea level about 24 ft. Indian Ocean water, metered to equal the Red Sea's estimated 1.5 million cfs evaporation rate, would then be admitted through power turbines with a capacity of 50 million kw.

AT LEAST THEY DIDN'T FIGHT—Unlike the recent Big Four meeting, the long awaited summit talk between labor and management closed on a note of complete agreement. After three hours of discussion the National Association of Manufacturers and the American Federation of Labor and Congress of Industrial Organizations announced their unanimous decision to recess for six to eight weeks.

HOW TO HANDLE WET JOBS

Project: Sewage Treatment Plant Extension, Bay Park, N. Y.
Contractor: Hendrickson Bros., Inc., Valley Stream, N. Y.



6-ACRE PLANT ADDITION DEWATERED FROM ONE CENTRAL PUMP STATION

Economy of operation was imperative in dewatering the above-pictured job site, which is located on water-logged Long Island's tidal flats. Hendrickson Bros. called for a wellpoint system which would predrain 3 separate areas, totaling more than 6 acres, from one central pump station.

- **On many previous occasions,** including the dewatering for the main plant at this same location in 1950, Hendrickson Bros. had successfully handled difficult wet work with Griffin equipment.

- **Griffin was called upon** to design and build pumps with extra air-handling capacity. With these pumps, operating from a single pump station, one wellpoint stage lowered 19 ft of ground water throughout the main excavation area. That's *low*-cost dewatering—by Griffin.

GRIFFIN WELLPOINT CORP.

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WASHINGTON OBSERVER

- **Public works money coming**
- **Snail's pace for Snake project**
- **U. S. road funds: Still waiting**

● **Congress is pushing through the big public works appropriations bill.** The House of Representatives has okayed $1.4 billion for projects of the Corps of Engineers, Reclamation Bureau and others. The Senate is expected to hew closely to that figure.

The House bill carries funds for 39 new projects—33 for the Corps of Engineers, six for the Bureau of Reclamation. Also included are loan funds for five new irrigation district projects.

Total cost to complete the new starts will be more than $500 million.

The House Appropriations Committee cut budget requests for public works construction activities by $77 million. Most of that reduction is based on the committee's conjecture that it can guess better about delays in spending than the Administration. Some $75 million of the cut is the committee's estimate of "slippages," that is, the difference between what is allocated and what is spent. The Administration estimates such slippages at $40 million for the Corps of Engineers and $10 million for the Bureau of Reclamation

President Eisenhower asked for 42 new starts in his January budget. The committee approved 38 of them and added a small one of its own. Biggest construction start deferred was the $60-million Milford Dam and reservoir in Kansas. The committee allowed money to complete engineering of the project but declined construction funds.

Reclamation's six new construction projects, costing $185 million, got starting funds in the bill. The committee trimmed $220,000 from a $445,000 advance planning request for the mammoth Garrison District project in the Dakotas.

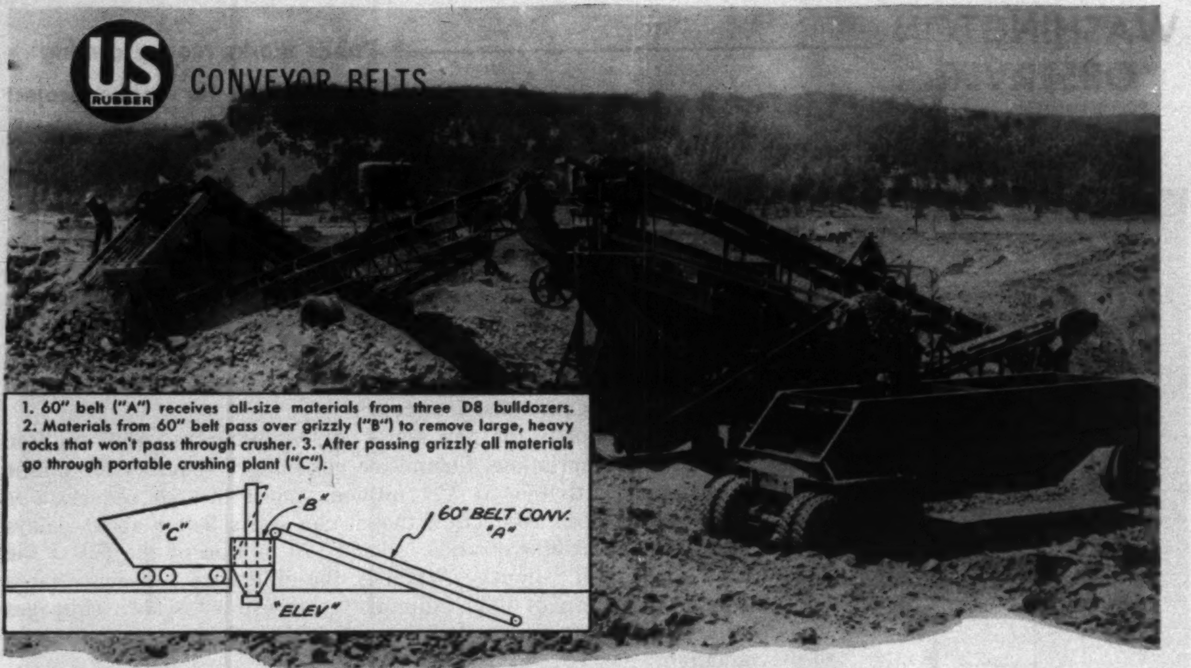
● **There's a new delay on hearings to determine how and where to build a high hydro-power dam on the Snake River.** Two conflicting applications are being pressed before the Federal Power Commission—but hearings now have been postponed until October.

Competing projects are the High Mountain Sheep Dam, proposed by the Pacific Northwest Power Co., which would cost an estimated $178 million, and the Nez Perce Dam, proposed by the Washington Public Power Supply System at a cost of $276.5 million.

● **The Bureau of Public Roads still isn't ready to tell the states how much federal funds they will have for the year beginning July 1.** The unofficial estimate is that some $2.9 billion will be parceled out, compared with $2.7 billion for the current year.

States will be given their new contract-letting authority for fiscal 1961 to be obligated equally in each of the four quarters compared to this year's schedule specifying varying percentages per quarter. States will be allowed to carry forward to the new year any unused obligational authority, too.

US RUBBER CONVEYOR BELTS


1. 60" belt ("A") receives all-size materials from three D8 bulldozers. 2. Materials from 60" belt pass over grizzly ("B") to remove large, heavy rocks that won't pass through crusher. 3. After passing grizzly all materials go through portable crushing plant ("C").

Conveyor equipped with U.S. Matchless Belt increased production from 175 tons to 300 tons per hour

Such records as this have made U.S. Rubber the world's largest producer of conveyor belts.

In this instance the "U. S." Belt helped increase production at the Carlson-Lien Company (Piedmont, S.D.), a supply firm currently producing road-building crushed rock and delivering it to highway projects. The belt is 60" wide, 35 feet from center to center (78 feet overall). "Our intention," says Bruce Lien, company secretary-treasurer, "is to replace all belts with U. S. Rubber Belts."

In this operation, bulldozers push the rocks to be processed into the loading point. The conveyor belt then carries this material to the grizzly. The belt was designed to withstand direct loading by bulldozers. The impact of the large rocks falling directly on the belt does not damage the conveyor system. This permits the grizzly to be placed at the discharge end of the conveyor instead of at the feed point as in conventional installations.

The superiority of this belt not only helped speed up and increase production, but also eliminated the need for three or four men to laboriously remove large rocks that would damage a belt of inferior quality. The "U. S." Belt proved so efficient in tons moved per hour that another bulldozer was added to keep the loading pit stocked with raw materials. "The belt will pay for itself on this one job. We recommend it to anyone," says Bruce Lien.

• • •

When you think of rubber, think of your "U.S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

Close-up of 60" U. S. Matchless® Belt carrying rocks from raw material pit up incline to crusher.

This installation was handled by "U.S." Distributor W. S. Nott, Minneapolis

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

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While Construction Booms—

ENR spot-checks the nation's engineering firms

...ST. LOUIS--"WE EXPECT A TREMENDOUS AMOUNT OF WORK IN POLLUTION ABATEMENT."

...CHICAGO--"OUR BUSINESS IS DOWN 10PC AND MIGHT DECREASE ANOTHER 10PC IN THE NEXT SIX MONTHS."

...MIAMI--"EVERYBODY IS BUSY, BUT WE ARE NOT WORKING OVERTIME AS WE DID LAST FALL."

...CHICAGO--"BUSINESS IS BETTER THIS YEAR BY 10 TO 15PC AND WILL BECOME INCREASINGLY BETTER."

...CLEVELAND--"OUR BUSINESS IS BETTER THAN IN '59, BUT IT'S HIGHLY COMPETITIVE."

...NEW YORK CITY--"INTERSTATE CONFUSION, INVESTIGATIONS AND RED TAPE ARE FOULING UP THE WORKS."

...SAN FRANCISCO--"BUSINESS IS ABOUT THE SAME AS LAST YEAR--IT HAS THE SAME ELEMENT OF UNCERTAINTY."

...BALTIMORE--"THE LAGGING PACE OF HIGHWAY WORK IN THIS AREA HAS HURT US."

...DALLAS--"WE HAVE 20PC MORE WORK THIS YEAR THAN WE DID LAST YEAR."

...LOS ANGELES--"OUR BUSINESS IS EXCELLENT, AND WE HAVE PLENTY TO KEEP BUSY FOR THE REST OF THE YEAR."

...DETROIT--"WE HAVE QUITE A FEW PROJECTS LINED UP FOR THE NEXT SIX MONTHS. BUSINESS LOOKS BETTER."

For Consultants: How's Business?

Construction is booming. Proposed work has jumped and contract awards will not be far behind. Viewed in dollar volume of either backlog or work going to contract, the picture is bright.

But how are consulting engineers doing? Are they riding the swells in work to be designed and supervised? Are they hiring or firing? How do they see '60?

To get the answers to these questions, ENR surveyed 60 of the largest employers among consulting firms last week. Their answers indicate:

- Consulting firms generally do not have as many employees now as they had one or two years ago.
- Firms specializing in commercial and industrial building design are riding the crest of the construction wave. Many have record employment and peak workloads. But there are exceptions, particularly in the 11 western states, where industrial work had dropped off in the first three months of '60.
- Sanitary, hydraulic and foundation consultants are also doing well. But waterworks consultants contacted are struggling to keep work loads up to last year's level.
- Highway consultants—once the big-timers—are in a bad slump, with no relief in sight.
- Consulting firms in New York, Dallas, Houston and Los Angeles generally are prospering. Those in San Francisco and Boston are not.

Of the firms contacted, 42% report an increase in business as compared to a year ago.

Industrial building, particularly, is on the move. Fully recovered from the effects of the steel strike, industrial building plans are now back on the upswing that began early last year. ENR's latest construction estimates substantiate this: In the first half of May alone, more than $436 million for industrial building projects moved into the planning stage. That's double the whole of April, and tops every month since December, 1958.

Will industrial design work taper off towards the end of this year? That's the big question in consulting offices. Most think the answer is "no." But if industrial work does fall off, consultants expect an upturn in public works and continued commercial building to sustain activity.

Highway consultants on the other hand will tell you in no uncertain terms how bad business is. They blame their doldrums on the state highway departments, and on Bureau of Public Roads policy as to the role of consultants in Interstate work.

"State highway departments are trying to build up their own empires," said one New York City engineer. "They're undertaking detailed design projects all on their own; they hire for peak loads instead of for the average, and so build up mammoth staffs. They've taken over the work that we used to do."

Even when the highway departments give out work, consultants are not entirely pleased.

"The trouble with the Interstate program is that there are too many agencies involved. When you ask a question, you don't know how long it will be until you get an answer," explained a mid-western consultant.

"All we do lately is wait, wait, wait.

It's like walking around with weights on your feet," complained another.

One large New York consulting firm charges that state agencies tend to favor consultants within their states for political reasons. This sometimes means dividing one job up inefficiently among 10 small local firms, rather than giving it to a less expensive out-of-state firm.

Almost every highway firm surveyed reports business volume and employment down from last year. And they do not anticipate that the last half of 1960 will be any brighter. Several now are attempting to branch out into other areas of engineering.

A sharp letdown in proposed waterworks early this year (21% down from 1959) brought slack to some consultants. But the outlook for the second half of '60 is more promising (see p. 24).

Certain local conditions also have put private engineering firms beyond the pale of the expansion boom.

Some Boston firms are particularly vocal about their difficulties. Their problems are two-fold. They have been working on a series of big-time projects—the Niagara and St. Lawrence projects, Nike bases, overseas defenses—which now have started to dry up. To add to their woes, they say, the state government has consistently gone out of the state to make awards on big projects.

Some Boston firms are now looking more actively for out-of-state projects, and exploring the possibility of opening offices elsewhere. Employment layoffs may be in the offing.

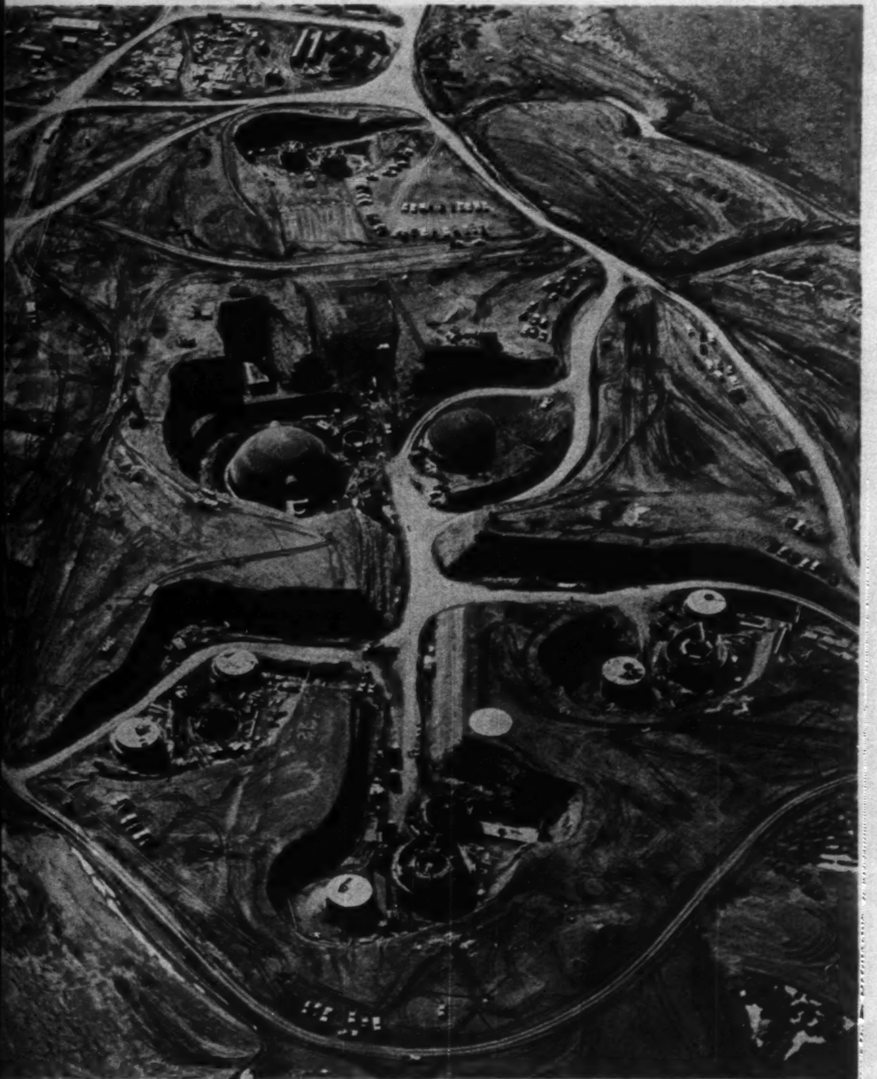
Generally, job opportunities with consulting firms are not nearly as bright as they had been in the recent past.

"In the latter part of the '50s job opportunities were considerably better than now," says a St. Louis consultant.

Similar reports came from many other consultants. Nowhere is there a clamoring for engineers. June graduates will have to scratch for a job with consultants. Indeed, fewer than half the firms surveyed plan to hire any graduates at all. Others are thinking of taking only two or three.

Some firms are even dropping young engineers hired during the staff expansions of the '50s. "Things have been a little quiet during the past five months and we have used this time to clean out some dead wood, men who were not pulling their load," said one consultant who recently discharged 35 men.

Although most of those surveyed expect an upturn in business in the



Backfill will cover these Titan facilities at Lowry AFB, Colo.

It's Dig We

As the summit conference crumbled under the onslaught of Russian rocket rattling last week, 300 military engineers were listening carefully to a symposium on protective construction in Washington, D. C.

The crowded meeting of the Society of American Military Engineers heard a recommendation that engineers experienced in base hardening be brought into the early stages of studies for new weapons systems.

And, while elsewhere diplomats were speculating on the future of atom test-ban negotiations in Geneva, the military engineers heard that there was no substitute for multi-kiloton and megaton tests of protective construction. So said Eric H. Wang, chief of the Structure Division in the research group at Kirkland AFB, N. M., in a paper read by Maj. Robert A. Harris, his chief deputy. Extrapolation of small-scale laboratory tests produces apparently satisfactory information for some effects, Mr. Wang explained, but realistic determination of structural behavior under multi-megaton explosions is impossible during the test moratorium.

The Wang message stressed that he is not pleading for lifting the present moratorium on above-ground nuclear explosions. His purpose was solely to let the scientific community know that both military and civil defense construction must limp along with partial, unproved design information until an atomic warhead hits a hardened base. Until this happens designers will have to use higher safety factors and build at greater costs than would otherwise be necessary.

Early entry of expert base-hardening engineers into preliminary studies of

second half of this year, few plan to employ any more engineers. Many firms are now operating at between 50 and 90% of capacity. They could easily take on more work without a bigger staff. Even those firms who claim to be working at 100% capacity say that if they got any new contracts they would prefer to put their current staff on overtime rather than take on more men.

Certain structural designers are an exception. Their peak workloads have them looking for more employees.

Has the computer caused a drop in employment or affected business? No, say the consultants. In some instances it even may have brought more business and employment to a firm.

"The computer enables us to take on jobs that we probably would have had to turn down before," said a major bridge consultant.

"The electronic computer has not made it possible for us to do more work with fewer engineers as yet, but it has helped us to turn out work faster," commented a Dallas engineer.

Said one consulting engineer, who used computers extensively for highway work: "The computer reduces time-consuming, tedious work, but it does not replace engineers. It has displaced the 'computer man,' however – the man who never did much drafting or engineering, but was very good in handling geometry and mathematical problems. Despite the ads, we do not feel that the computer is an electronic brain—it is a clever device to do mathematics."

How do consultants view the business picture for the next six months? Except among highway consultants the outlook is optimistic, though tempered with caution. "Business looks favorable for the next six months, but we don't expect a boom," said a Detroit engineer.

"Clients are optimistic about the future. We have some signed contracts with clients who have been holding off for various reasons, but should come through within the next six months," said a Florida consultant.

"Business at present is at the same level as a year ago," said a Pittsburgh consultant, "but there is one very important difference: A year ago at this time, the firm was on a downtrend. Now business is shaping up to be much better in the next six months, the trend is definitely up."

Must to Protect Missile Bases

new weapons systems was strongly recommended by Jack O'Sullivan of the Mitre Corp. Ordinarily, experts on protective construction don't get into the program until system design is virtually complete and hardened installation is ordered, Mr. O'Sullivan said. By that time, defense urgency prevents modifications.

Not all defense construction needs hardening. The $500-million BMEWS radar base at Thule, Greenland, which will be scanning Russian skies 24 hours a day within the next few months, has no need for protective construction. An attack there would instantaneously alert our retaliatory force.

(Vincent Smith of ENR's Washington staff, who was in Thule last week, quotes Gen. Thomas S. Power, chief of the Strategic Air Command, as saying that all he wants of BMEWS is to let him know he is still alive. A blast at Thule would give the Strategic Air Command more than the minimum 15 minutes required to get our bombers and supplemental airborne command posts off the ground.)

Thule's powerful radio-frequency beams project two fan-shaped layers over practically the entire Communist land mass. Flanking BMEWS stations, at Clear, Alaska and Flyingdales Moor in England, complete the radar screen against missile attack.

These two installations were ordered speeded up last week to advance the previously set operation dates, summer of '61 for Alaska and '63 for the installation in England.

"Hardening is just an economical means of achieving dispersal," said Brig. Gen. Harold K. Kelley, deputy director for construction of the Air Force civil engineers. Against a five-mile weapon, he said, dispersal of some 20 miles is required to force an attacker to use separate missiles. Hardened to resist 100 psi overpressure, however, the same facilities need be only about three miles apart. In 10 years, he noted, our base-hardening level has risen from 10 psi to 25 psi and now 100 psi. In the near future several hundred psi may be required.

Spacing facilities at closer intervals often saves more in access roads, communications and the like than it costs to harden the complex, other panelists pointed out. But balancing of dollars against results rules the decision still to be made on aircraft shelters, for example. ICBM bases, of course, are hardened without question. Protection for these sites is worth almost any expense, but costs at missile bases are being pared by improved design both of the weapons themselves and of the ground support facilities.

Advent of the all-inertial guidance system has made it possible to design and build fully hardened bases for both the more advanced Titan missile and the older Atlas, with the weapons stored and fueled in vertical position in underground silos.

The 3x3 (three-squadron) Titan installation at Lowry AFB, Colo., stores and fuels vertical missiles in subsurface silos. But the weapons, though fueled underground, still have to be raised to ground level for firing.

Base designers, of course, are waiting for a missile that will contain its own propellants and take off from inside the silo. The upcoming solid-fueled Minuteman missile will possess these capabilities.

Hardened shelters for airplanes are still an unresolved problem. Protective construction even for small-wingspan interceptors will cost plenty, Milton R. Johnson, leader of the weapons effects group, American Machine and Foundry Co., told the engineers. Defense policy makers have not yet decided whether to buy aircraft hardening or spend the same money for weapons and facilities that might add more power to U.S. arms.

New Roles Set for U. S. Underground Facilities

The Defense Department is spending $5 million to remodel two underground installations originally built during World War II in Hawaii.

One project is a $3-million renovation of the gigantic Red Hill diesel and fuel oil storage vaults near Pearl Harbor (ENR Dec. 27, 1945, p. 61). This $42-million job was one of the engineering marvels of the war. Twenty giant concrete tanks, with 100-ft-dia cylindrical shafts and hemispherical ends measuring 250 ft end-to-end, were cast underground in rock.

The current project involves preparing four of these tanks for storage of aviation fuel, adding seven miles of additional pipeline, and building a tunnel and an elevator shaft.

The other project will convert a $25-million underground structure, called "The Hole," into a combat headquarters. Built during World War II to house an aircraft factory that was never assembled, the three-level structure will be linked with elevators and fortified from bacteriological and chemical attack.

Experts See Heavy Spending Ahead

If necessity is a gage, water supply construction in the U.S. is due for a 20-year boom. Knowledgeable voices spelled out the needs at the American Water Works Association's convention in Miami Beach last week, and ENR's construction figures and forecasts show the steep climb already has begun (see below).

"The total annual construction job facing [the water supply] industry reaches the sum of $1.155 billion," concluded Raymond J. Faust, AWWA's executive secretary. His figure, synthesized from a number of sources, would cover current water system deficiencies, anticipated population increases and the cost of improving water quality.

A huge construction program on river control and storage projects was anticipated by Theodore M. Schad, staff director of the Senate Select Committee on National Water Resources. Disclaiming authority to anticipate committee actions, but speaking from familiarity, as staff chief, with the evidence gathered by the committee, he predicted that the U. S. will need dams and reservoirs to virtually complete the control of river flows, a condition experienced only in the more arid regions of the West heretofore.

The biggest single item in Mr. Faust's prediction of costs is new service. Average population growth will total 3.9 million a year between now and 1980, he said. Figuring from an estimate by Louis Howson, Chicago consulting engineer, that it takes $250,000 capital investment at 1959 prices to add service for each 1,000 new consumers, Mr. Faust believes population increases will require an outlay of $810 million a year from now until 1980. The total 20-year expenditure for this item would be something over $16 billion.

The second biggest item on Mr. Faust's list is $250 million a year to correct water-system deficiencies. He reviewed a 1955 survey by the U.S. Public Health Service showing that of water systems serving communities of 25,000 and more in the U.S., one out of five was deficient in supply, two out of five in transmission capacity, one out of three in pumping capacity, two out of five in treatment capacity, 29% in ground storage capacity, 43% in elevated storage capacity and 57% in distribution facilities.

Lack of progress in eliminating the deficiencies might be indicated, Mr. Faust said, by results of a recently completed study by Kenneth Carl, of the National Board of Fire Underwriters. Of 89 cities previously surveyed by NBFU on the basis of adequacy for consumption and fire flow under normal conditions and reliability for consumption and fire flow under certain emergency conditions, 47% have improved 12% have held their own, and 41% have retrogressed, the resurvey shows.

The cost of eliminating the deficiencies was estimated at $5 billion by Walter Picton, of the Commerce Department's Bureau of Business and Defense Services. Spread over 20 years, the annual cost would be $250 million, Mr. Faust pointed out, with the industry still retrogressing in its ability to meet needs.

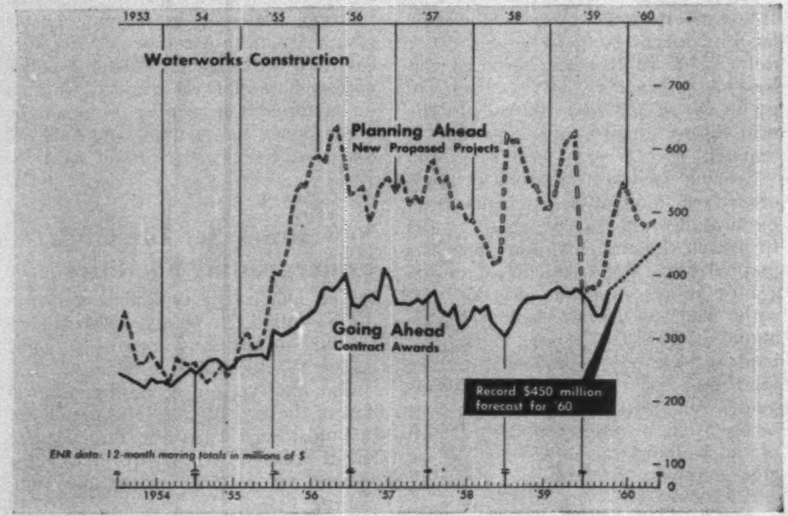
Mr. Faust's third item, quality improvement, can be counted a byproduct of past progress. The prime objective in the past, he recalled, has been "for good reason" safe water. U. S. Public Health Service Drinking Water Standards, first promulgated in 1916, then revised in 1925, 1942 and 1946, and now possibly to be revised again, have had one aim—public health. You couldn't talk of lesser values when people were sickening and dying from bad water, he pointed out.

But now that a traveler can go from coast to coast and use public water supplies confidently, we can and should tackle other things—turbidity, for example. The PHS standard tolerance of up to 10 ppm of turbidity might be safe, he said, but it can't be considered quality.

While "quality" has not been defined, Mr. Faust conceded, water with 1.0, 0.5 or even 0.2 ppm of turbidity, as produced by well run filter plants, might be approaching quality, he said.

He suggested also that distribution systems might be kept a lot cleaner than many of them are now if test samples were taken at the customer's tap instead of from the water plant's effluent.

The extra cost of quality water would be difficult to state, Mr. Faust said. "But I estimate the construction cost at about $15 per person, or approximately $1.9 billion. With the work


Waterworks Construction

Record $450 million forecast for '60

ENR data: 12-month moving totals in millions of $

For '60: A Waterworks Record

Waterworks construction is pulling out of the temporary slump it hit in the second half of 1959. Contractors chalked up an 8% gain in new waterworks business during the first 20 weeks of '60, according to ENR figures.

By year's end, contracts should reach a new high of $450 million, up 20% over last year's record. The faster tempo of lettings—expected to lift waterworks construction to an all-time high—reflects 1959's spurt in proposed waterworks construction on the drawing boards. As more and more of these jobs move from planning to bidding, contractors will become busier.

Major forces behind the step-up in waterworks construction demand are the large number of new, big mass housing developments and the increasing number of new industrial plants, many requiring more water than present facilities can supply. Mass housing contracts head for their third consecutive annual increase (awards to date top '59 by 41%). Meanwhile, industrial construction is climbing for the second consecutive year.

for Water

spread over 20 years, the cost would be about $95 million per year."

Mr. Schad's report is the first summary to be issued on progress of the two-year U. S. water resources study undertaken by the Senate committee over a year ago.

The findings of the staff to date, with most of the background reports in and all but one of the 20-odd public hearings completed, present a pretty depressing water outlook for the country as a whole, but a challenging one for the construction industry and research people. It will be up to these two groups to make the most of what we have through river control, treatment of water and wastes and development of new resources and techniques.

Mr. Schad pricked a balloon that has held aloft the hopes of some people. "We cannot count on a scientific miracle to help us out," he declared. Progress reports filed with the committee on desalting of sea water and artificial inducement of rainfall "give no concrete evidence which would lead one to expect early success," he stated. "In my opinion, it would be a grave mistake to place any great degree of hope on finding an early solution to our water problems from either of these sources."

The committee job is to find out how much water development will be needed between now and 1980, when and where it will be needed and what the pattern of development should be. It is also charged with ascertaining how much public and private money can be economically spent for water development programs.

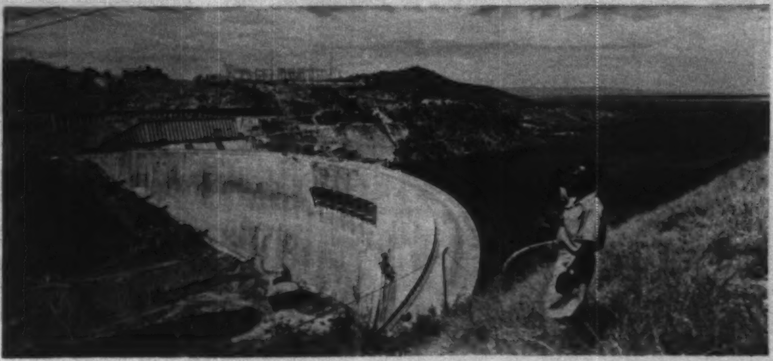
Information gathered so far shows that future waste loads in streams would require dilution flows so heavy as to be out of the question, Mr. Schad said. The Ohio Basin, for example, he pointed out, would require by 1980 several times the presently available 6 million acre-ft of reservoir storage to provide a reasonably clean river.

"Reasonably clean" is defined as 4 ppm of dissolved oxygen, he said. We could live with such water, he declared, but it would mean odorous and bad-tasting water at some times and places and possible elimination of all but rough species of fish.

Altogether, the studies indicate, the nation's combined water needs by 1980 may approximate the 600-billion-gallon-a-day supply that some engineers recognize as the total amount of water practically available at present, he said. He stated that this totaled about half the average runoff of all the streams in the country.

The answer, Mr. Schad indicated, is re-use, over and over again.

A new airport greets airborne visitors to . . .



. . . Kariba Dam, a monument to an awakening continent.

Kariba's Power Now Official

With a lace-gloved hand, Queen Mother Elizabeth of Britain last week pulled the switch that put Kariba Dam's second 100,000-kw generator on the line and formally opened the giant hydroelectric project on the Zambezi River in Rhodesia.

Although still running at only an eighth of full power, the dam has already transformed its neighborhood, in the heart of Africa. The graceful double-curvature concrete arch is in stark contrast to the untamed jungle around it.

On newly created Lake Kariba sits a complete community for 60,000 persons. Built from scratch, it sports a school system, banks, churches, a hospital and an airport, Kariba's main link with the outside world.

The airport replaces an original strip now under Lake Kariba. The lake itself will soon be the largest man-made body of water—175 miles long and impounding 130 million acre-ft.

First power from the underground power house of the $224-million first stage began flowing to Northern Rhodesia's copper belt last December (ENR Feb. 25, p. 60). This initial stage, which includes the dam and six 100,000-kw generators, is scheduled for 1961 completion. By 1970, nine second-stage generators will go on the line, providing the full 1.5-million-kw boost for the future industrialization of the Federation of Rhodesia and Nyasaland (ENR Nov. 20, 1958, p. 34).

Construction of the 420-ft-high plug in Kariba Gorge ran the gamut of nature's hazards from a raging flood that breached the main cofferdam, to islands full of stranded elephants and deadly snakes (ENR Mar. 6, 1958, p. 31; Sept. 11, 1958, p. 107). Accidents on the job have thus far claimed 93 lives.

POWERHOUSE is 600 ft underground.

Jet Blast Rips Asphalt Runway

The jet blast from a United Air Lines DC-8 trainer ripped up an 80x110-ft section of old asphalt pavement from a runway at Denver's Stapleton Field. The asphalt broke up as the plane was preparing to take off.

This is the first report of extensive damage of this type. A somewhat similar phenomenon has been observed during jet operations at New York's Idlewild Airport. There, comparatively small patches of asphalt have been lifted from the surface of a portland cement concrete runway.

The Denver runway was built in 1940-41 as part of a WPA project. Base course is 8 in. thick, consisting of 6 in. of waterbound macadam (3-in. maximum size of aggregate) and a 2-in. leveling course of crushed stone. Original surface was 2 in. of plant-mixed asphaltic concrete. Over the years, several seal coats had been applied, adding about ¼ in. of thickness.

There was evidence that water had seeped down through the surface course into the base, causing separation of the two layers in some locations. Exact cause of the break-up is not known.

Don Crichton, airport engineer for United Air Lines, said: "Any crack in asphalt pavement is apt to be vulnerable to a lifting action from the jet blast that we haven't suspected. It appears that if the jet blast enters any crack—and it wouldn't have to be much of a crack—the pressure builds up quickly and you get an explosive action. This would indicate that we're going to have to have better airport maintenance than we've tolerated in the past. Certainly the runway surface, no matter what the material is, will have to be kept smooth and free of cracks.

"The surface where the asphalt was peeled back was alligatored. We suspect that there was a triangular section where the jet blast entered and the lifting action built up."

Cost of repairs is expected to be about $3,000.

The City of Denver has approved a $20-million program of improvements for Stapleton Field. The first revenue bonds ($11.7 million) are to be sold this month.

Republicans Offer New Depressed Areas Bill

A new Republican version of a bill to aid depressed areas was presented last week by Rep. William B. Widnall (R., N. J.), but prospects for Democratic acceptance of it were less than zero.

Its proposals might have some influence if the majority leaders decide to try a compromise bill, following failure to override the President's May 13 veto of their own version.

This is what the Widnall bill would do: Add 12 areas to the restricted list that would be eligible under the original Administration draft; authorize $75 million for plant construction and renovation loans, the same amount as in the vetoed bill, but with lending assistance limited to the Administration ceiling of 35% instead of the Democratic 65%; and double the current $100-million loan authority of the Housing and Home Finance Agency for financing public facility construction in smaller communities that cannot borrow money at reasonable rates.

The vetoed Democratic bill would provide $85 million for construction of local public facilities, $50 million in low-interest loans and $35 million in outright grants to both rural and industrial areas.

Probers Stay at It

Highway committee gets file of fresh scandals

The House committee investigating administration of the Interstate program, which found wrongdoing in Oklahoma, is getting new tips and leads every week.

Committee staffers are compiling a dossier of cases from a steady stream of letters, telephone calls and newspaper stories. The committee hopes to get enough fodder for early hearings.

- Out of a western state come reports of contractors paying off state highway officials, and allegations of complex land speculation deals where a few people have "cleaned up."
- Arizona newspapers have blasted at questionable land dealings in that state. The ARIZONA REPUBLIC of Phoenix has had front page stories on combines formed to speculate in land where the Phoenix-Brenda bypass may be located. The gimmick in the deal, the newspaper claims, is that members of the land-buying combine include a former governor, an employee in the state auditor's office, two members of the state highway department's planning survey division, and the like.
- Ohio Republicans are charging political favoritism is rampant in the state highway department. It's charged that "two favored sons of the Democratic state administration have received more than $1,280,000 in state highway department business since the first of the year" in sales of materials.

Other unrelated reports on Ohio highway construction contracts point to such things as sections of roadway sinking due to alleged poor construction; the collapse of a pier on a major bridge because of improper construction; contractors being squeezed out of bidding on projects because of their political affiliation; the use of certain types of construction materials because political favorites supply them; and high prices paid to politicians for condemned property.

- From an eastern state come charges of politically influenced route locations; of excessive use of consulting engineers and of deliberate over-designing being done by the consultants. Collusion between suppliers and buyers of state construction materials is another complaint coming from along the eastern seaboard.
- Allegations are made in a southwestern state that substandard materials are going into highways; that tests are not being conducted as required; and hints that some state and even Bureau of Public Roads inspectors are reaping fat profits from some of the roadbuilding shinanigans.

How protection in depth helps cut compensation costs

Every hazard he spots can save you money

Contractors who insure with Liberty Mutual value the aid of a Liberty loss prevention engineer. His practiced eye sees hazards that others might miss. He learns every phase of your operation, understands your job plans and problems. Briefed in advance, he can help you reduce accidents and losses, keep your compensation costs down and improve worker efficiency. Safety engineering is but one of the many Liberty Mutual services that add up to protection in depth. To learn more about Liberty's protection in depth and how it can help lower your business insurance costs, get in touch with your nearest Liberty Mutual office.

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NEERING ACHIEVEMENT
AND POWER PROJECT
CIVIL ENGINEERS

Robert Moses receives from Frank Marston ASCE's . . .

Award for the St. Lawrence

The new award by the American Society of Civil Engineers for the "outstanding civil engineering achievement of the year" was bestowed on the St. Lawrence Seaway and Power Project last week in a ceremony at the U. S. end of the power dam in Massena, N. Y.

About 200 U.S. and Canadian Engineers, contractors and government officials witnessed the awards after spending the morning touring the extensive project.

Bronze plaques were presented by Frank A. Marston, consulting engineer of Boston and ASCE president. Receiving them for their organizations were Robert Moses, chairman, Power Authority of the State of New York; Lt. Col. A. A. Kennedy, commissioner, Hydro-Electric Power Commission of Ontario; A. G. Murphy, chief engineer, the St. Lawrence Seaway Authority; and Martin W. Oettershagen, deputy administrator, Saint Lawrence Seaway Development Corp. Charles B. Molineaux, vice president ASCE, Zone 1, acted as master of ceremonies.

The St. Lawrence Project was selected as the outstanding civil engineering achievement by a board of judges made up of editors of engineering and construction magazines.

They reviewed a list of nominations drawn up by the Society's Board of Direction.

Congress OK's San Luis Project

Congress gave its final approval last week to the $290-million San Luis addition to the Bureau of Reclamation's Central Valley Project in California. The San Luis authorization bill now goes to the White House, where President Eisenhower is expected to sign it.

The House of Representatives, by a 214-181 vote, last week, approved the bill, after voting also to require the federal 160-acre limitation on irrigation benefits to apply to all lands either partly or wholly irrigated by San Luis. In adding this limitation, the House followed the action of the Senate, which had added the same restriction when it approved the authorization last year.

The San Luis authorization may aid chances of the $1.75-billion bond issue to be voted on in California this fall. The bonds, which will go largely to financing California's huge and controversial Feather River project, have been under attack, and some California observers think the voters may turn thumbs down.

San Luis and Feather River would overlap in some areas. Feather River water would flow to southern California partly through San Luis canals, and both projects would use the same water in other irrigation areas.

The San Luis project, which will irrigate about 500,000 acres of California lands, consists of the San Luis Reservoir and necessary canals and pumping stations.

State and local money added to the $290 million of federal money run the project cost up nearly to $500 million.

The project would take surplus runoff from the Sacramento and San Joaquin rivers, transport it via the Delta-Mendota Canal to the new San Luis Reservoir for distribution to southern California irrigation areas.

'Hot' Problem

Objection to atomic waste dumping may halt projects

Radioactive wastes became a ho topic last week in New York and Mass chusetts.

In Massachusetts, residents of Cape Cod, the state's vacation peninsula, are fighting a proposal for an industrial atom research center in the vicinity of Buzzards Bay.

In New York, a plan to store atomic wastes in abandoned salt mines has been condemned as a threat to the state's water supply.

Opponents of the Cape Cod development claim it would be used as a reprocessing center for atomic wastes from all nuclear reactors in the East, some in Europe and from nuclear-powered ships. Cape Codders, already worried about off-shore dumping of wastes, fear the center would endanger health and damage the lucrative tourist industry.

The Massachusetts Commission on Atomic Energy says such fears are premature. The commission is emphasizing the advantages for research that the proposed center would provide.

Other proponents say, "It's a problem of educating the people to the true facts," strict controls would make radioactive dangers negligible and the project would have a stabilizing effect on the Cape's economy, providing a year-round industry.

The idea for salt-mine storage in New York came about to encourage just the kind of project under fire in Massachusetts.

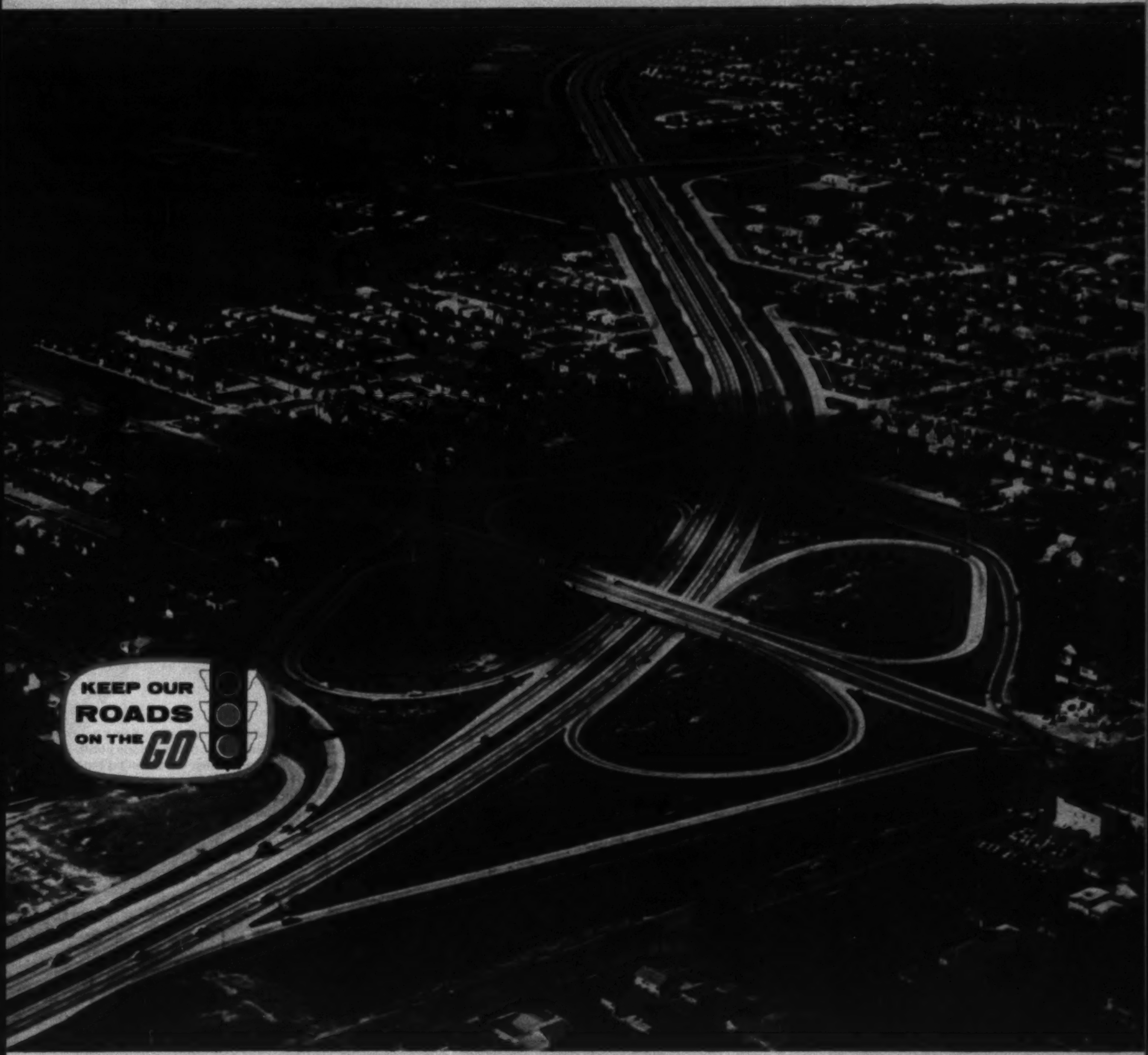
Silver Townsend, director of the state Office of Atomic Development, suggested to a group of Buffalo industrialists that storing atomic wastes in nearby salt mines might prove an incentive for establishment of a fuels processing center in the area.

The suggestion brought a quick response from Stanley P. Spisiak, chairman of the New York State Conservation Council's water pollution committee.

He called for legislation that "should mandate that such materials are at no time to be pumped, dumped or released in liquid form into any mine, cavern or so-called disposal well, from which they might find their way into any underground streams, waterways or water table."

Mr. Spisiak warns that most surface streams are the overflow of an underground stream or water reservoir. If these were to become contaminated by atomic wastes it would only be a matter of time before the pollution would spread to all wells and surface streams, he says.

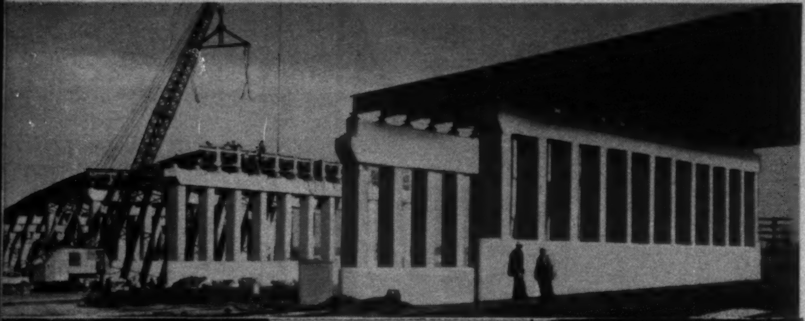
Interstate road construction on the go in Illinois


KEEP OUR
ROADS
ON THE GO

Interchange of U.S. Route 41 and Touhy Avenue in Lincolnwood, Cook County

Additional story and pictures on following pages ▶

Illinois builds 1,608 miles of



Left and above: Here are two of 2257 new bridges being built in Illinois. New bridges often carry traffic *over* previous bottlenecks, make for safer driving conditions, cut traveling time. In some cases creek or river beds are being altered so bridges can be placed in better locations. Many new bridges speed up traffic flow, are replacing old, narrow and unsafe structures. In most cases, USS Structural Steel offers the fastest most reliable and economical method of construction.

Culverts made from USS Galvanized Culvert Sheets are ideal for highway drainage. They completely absorb forces of impact and vibration, so they are excellent for use in high-traffic areas. Strict quality control through every step of production assures long life and dependable performance. Culverts shown here are on Interstate Route 74 in east-central Illinois.

Interstate roads

Products of U. S. Steel help keep Illinois roads on the go

Across the rolling prairies of Illinois a wide spiderweb of new highway construction is growing day by day. According to the Interstate Cost Study prepared by the Division of Highways of the State of Illinois in 1957, the estimated cost of 1,608 miles of new interstate roads and approximately 2,260 bridges in Federal and State funds would be $2,265,573,000. Already, 234 miles of road and 404 bridges have been completed, and under construction today are 140 more miles of road. This new highway network is part of the greatest building project of all time—the nationwide Interstate Highway System. It will relieve congestion and improve the safety record of roads in this rich agricultural-industrial state.

U.S. Steel provides much of the material for the Illinois road-building program. Cement, slag, reinforcing bars and welded wire fabric go into the highways and high-strength and constructional alloy steels, sheet piling, tubular piles go into bridges; drainage products made of USS corrugated galvanized culvert sheets or concrete carry away excess water. Wire rope, cable, tubing and special steels go into the construction equipment that moves the mountains of earth and lays the right of way. For safety, USS furnishes fence, beam and cable guard rail, steel for signs.

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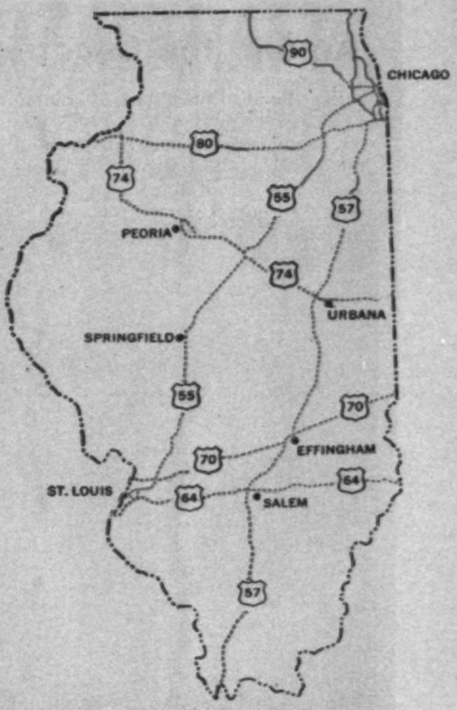
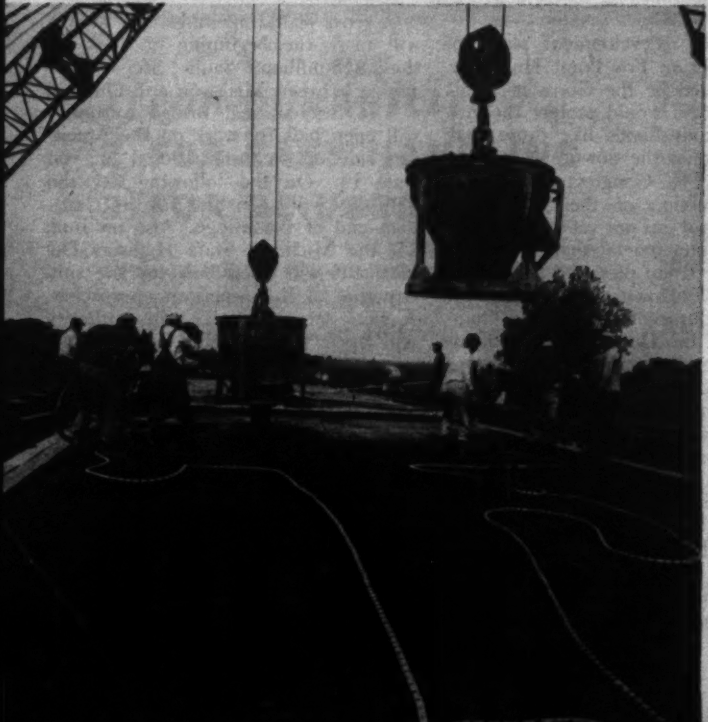


Illinois Interstate Highway network. Solid green lines indicate completed mileage or mileage under construction. Green dots are planned mileage or existing Illinois highways that will later go into the Interstate Program.

USS United States Steel

The highway market is served by the following divisions of United States Steel: American Bridge Division, Pittsburgh, Pa.; American Steel & Wire Division and Cyclone Fence Dept., Cleveland, Ohio; Columbia-Geneva Steel Division, San Francisco, Calif.; Consolidated Western Steel Division, Los Angeles, Calif.; National Tube Division, Pittsburgh, Pa.; Tennessee Coal & Iron Division, Fairfield, Ala.; Universal Atlas Cement Division, New York; United States Steel Supply Division, Steel Service Centers, Chicago, Illinois.



These men direct the Illinois highway building program (left to right):

William G. Stratton, Governor of Illinois.

Edwin A. Rosenstone, Director of Illinois Department of Public Works and Buildings.

Ralph R. Bartelsmeyer, Illinois Chief Highway Engineer & Immediate Past-President of the American Association of State Highway Officials.

Workmen pour concrete for bridge surface on Interstate Route 55. U.S. Steel supplies DI-LOK reinforcing bars for concrete construction as well as Steel Sheet Piling, USS Steel H-Piles, and Structural Carbon, Alloy and High-Strength Steels for the bridge itself.

KEEP OUR
ROADS
ON THE
GO

Write for the free 54-page booklet, "Keep Our Roads on the Go." You'll find all the United States Steel products and services that will help you cut costs and speed operations in highway construction. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

Around the Country . . .

- **Big Bend Dam starts**—Groundbreaking ceremonies this week kick off major embankment construction on $137.5-million Big Bend Dam, sixth and last of the Corps' main-stem Missouri River projects. A $3-million award went to Western Contracting Corp. last month.

- **Paradise No. 2**—Tennessee Valley Authority exercised options for a second 650,000-kw generating unit for the Paradise Steam Plant under construction on Kentucky's Green River. The second turbo-generator will boost the Paradise capacity to 1.3 million kw.

- **On and on**—Control group for the AASHO Test Road at Ottawa, Ill., has voted to continue traffic testing until November 30. Previous plans were to halt traffic on July 1.

- **Inventory time again**—Interior Department's Geological Survey plans to inventory water use in the U. S. during 1960 as it did in 1955 and 1950. Increasing demands and dwindling supplies in some areas make the latest survey necessary.

- **Twin Towers**—Next addition to the apartment buildings surrounding Philadelphia's Rittenhouse Square will be a $9-million, 32-story structure, framed in reinforced concrete. Twin Towers will contain 500 dwelling units. Designer is Philadelphia architect, Milton Schwartz & Associates; structural engineer, Dorfman-Schwartz, also of Philadelphia. Owner is Webb & Knapp of New York City.

- **Hydro wedding**—The City of Everett, Wash., and the Snohomish County Public Utility District are about to form a partnership to develop the water supply and power potential of the Sultan River. When completed, the proposed program would provide over 330 mgd of water and 140,000 kw of power.

- **Costly center**—Estimates of a proposed wholesale food center for Detroit range from $60 million to $86 million. The giant center would save consumers and food sellers $5 million annually, according to a report by the U. S. Department of Agriculture.

Providence Plans for 1970

The $102-million redevelopment plan for Providence (ENR May 12, p. 17) envisions a thriving commercial, cultural and residential downtown area by 1970.

First step: Create a non-profit corporation composed of business, civic and political leaders to promote the plan and to coordinate the work of private and government agencies in carrying out individual projects.

Private capital would finance over half the program; municipal, state and federal governments account for 30%; and special authorities, 20%.

Key to the whole program is relocation of the New Haven Railroad tracks and station. This would reclaim 50 acres, now inefficiently used, and make land available for a $28-million Civic Center grouping city, state and federal office buildings.

Other major projects:

- A retail shopping area centered on a pedestrian mall.
- A freeway system bounding the downtown area on two sides.
- A convention and sports center with a 10,000-seat arena and 25,000 sq ft of exhibit space.
- Residential development, comprising public and private housing, high-rise apartment buildings and row houses.
- Office buildings to supplement existing ones.

The whole redevelopment plan depends heavily on Fox Point Hurricane Dam, designed by the Corps of Engineers. The dam would protect the city from disastrous floods like those that flooded most of the downtown area in 1938 and 1954. Congress has authorized construction of the $18-million dam, though it has not yet appropriated the $12-million federal share.

A 2½-year study preceded the recent release of the Downtown Master Plan by its co-sponsors, the City Plan Commission and the Downtown Coordinating Business Council. A federal grant under the Urban Renewal Administration's Demonstration Grant Section financed two-thirds of the $165,000 study. City and private funds furnished the balance.

Four citizen groups cooperated in publicizing and planning the program.

Project director for the study was Mr. Dieter Hammerschlag of the City Plan Commission. Frank H. Malley is the commission's director.

Chicago Awards Contract To Extend Its Navy Pier

The City of Chicago's Department of Public Works has awarded a $1,875,000 contract to Raymond International Inc., New York City, for construction of a 1,250-ft-long extension of Navy Pier in Lake Michigan.

Being built to handle increased shipping generated by the St. Lawrence Seaway, the new pier is of concrete design. It is completely fireproof and will be virtually maintenance-free. Its 96-ft-wide deck of precast, prestressed concrete planks will support two railroad tracks.

Prestressed concrete cylinder piles will support the pier deck. Over 300 piles will be manufactured locally, trucked to the waterfront, then barged to the site, where they will be driven to an elevation about 78 ft below lake level. Piles will be about 80 ft long and 3 ft in dia. Their 4½-in. walls will have eight 12-wire prestressing cables tensioned to 160,000 psi. The piles have a maximum design loading of 230 tons. Concrete in the piles will have a minimum strength of 7,000 psi.

Six-pile bents spaced 24 ft c-c will be capped with formed and cast concrete. Prestressed concrete planks spanning the bents will be 4 ft wide and variable in thickness, with a minimum of 7½ in. at mid-span. A 6-in.-thick concrete surface will be placed on top of the prestressed planks.

The new pier was designed by the Bureau of Engineering, Chicago Department of Public Works.

Bid Openings Coming for Michigan-Ontario Bridge

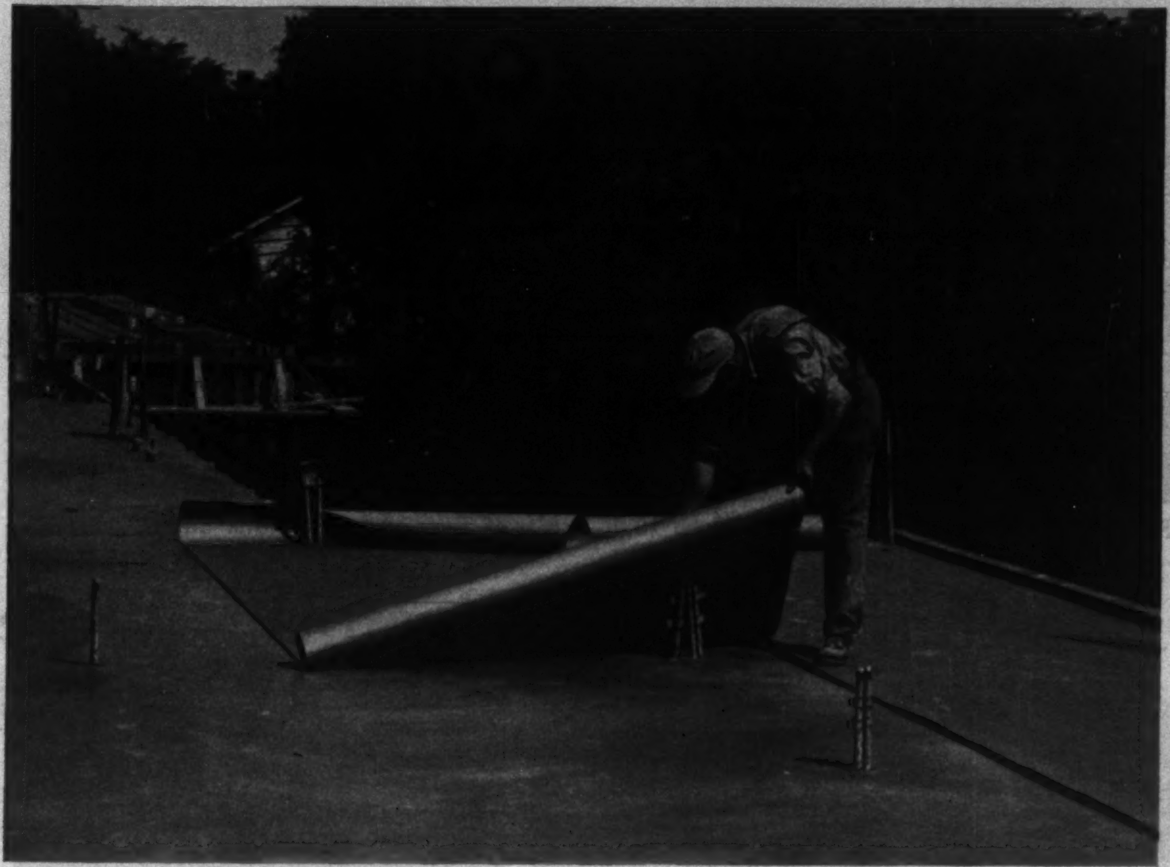
A series of bid openings next month will mark the beginning of work on the $18-million Sault Ste. Marie bridge between Michigan and Ontario.

The International Bridge Authority will open bids for work on the American side of the international line on June 14. On the following day the authority will open bids for the Canadian end of the bridge. Also on June 15, the Michigan State Highway Department will open bids for the substructure of the American approaches. A week later, June 22, the authority will open bids for the Canadian approach span.

Tentatively scheduled to start August 1 is sale of some $17.4 million in bonds to finance the work. September 1 was set as the latest date bonds are to be sold. Contracts will not be awarded until after the bridge bonds are sold.

The U. S.-Canada link will have 12,000 ft of bridge and approaches (ENR Jan. 22, 1959, p. 28). Designer is D. B. Steinman, New York City consulting engineer.

NOTHING CAN MATCH **SISALKRAFT** FOR PROTECTING NEW CONCRETE



① FOR DURABILITY
② FOR EASY HANDLING
③ FOR RE-USES

Tough Sisalkraft papers remain the most practical method of covering newly-poured concrete. These reinforced, scuff-resistant papers have "body" . . . handle well even on a windy job. In addition to low material cost, quick and easy application means minimum labor cost.

The Sisalkraft line includes *Orange Label Sisalkraft,® reinforced waterproof building paper; Copper Armored Sisalkraft,® electro sheet copper flashing; Sisalation,® reflective insulation; Moistop,® reinforced paper and polyethylene vapor barrier; Vaporstop*, rot-resistant vapor barrier; Seekure*, non staining waterproof paper; Sisal-Glaze*, Eskay-Lite* and Sisalite,® clear plastics.*

*Reg. Applied for

Concrete floors and slabs with clean, hard, dust-free surfaces are assured. Widths from 36" to 96", special rolls up to 26½'. Exclusive "Bleached White" Sisalkraft for highway curing.

NEW: The Sisalkraft Joint Former offers a new low cost way of forming contraction joints with removable plastic strips. Write for bulletin to American Sisalkraft Corporation, Attleboro, Massachusetts.

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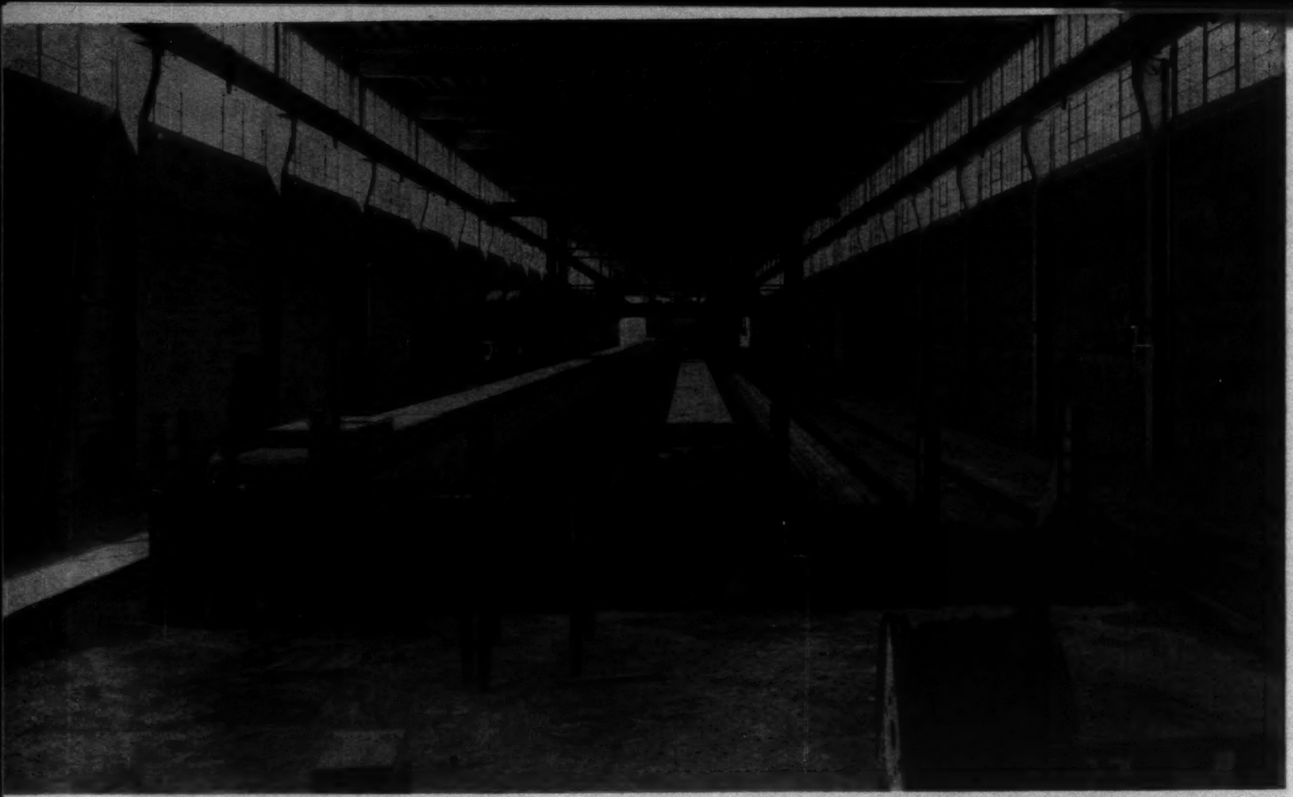


Prestressing plant will eventually produce 20,000 sq ft of floor and roof plank daily.

Rapid Casting Promises Wider

An East Coast manufacturer will soon be able to produce enough prestressed concrete plank in one day to roof a 20,000 sq ft building. And the assembly-line production style promises to extend the use of standardization prestressed concrete products.

Key to the process is a German-invented concreting machine. It's housed in a building walled with the product it makes. The machine hangs from a gantry crane straddling six prestressing beds, each 450 ft long. Traveling 5 fpm along the rails, it deposits concrete at rates regulated by the 4-, 6-, and 8-in. plank thicknesses.

At present, three daily machine trips, down a different bed each time, produce 5,000 sq ft daily. This production rate will double by mid-summer, when six more 450-ft prestressing beds will be completed, and the building will be extended to 1,200 ft. Installation of another concreting machine will raise the daily production potential to 20,000 sq ft, with the plant force on two shifts.

The plank is produced in stacks over 5 ft high in each of the six beds. This allows eight 8-in. sections, ten 6-in., or sixteen 4-in. sections. Fine sand, dusted on top of each plank after it hardens, prevents bond with the next plank above.

First step in the production sequence is strand-stringing and tensioning. A small, gasoline-powered tricycle—the "rabbit"—rolls down the bed carrying a prestressing strand. (Horizontal wheels braced against both sides of the bed hold the rabbitt on course.) When the rabbit reaches the tensioning end of the bed, a workman threads the cable through an anchorage cone and attaches it to a pulley system weighted with ballast to exert prestressing force. After releasing the pulley to prestress the strand, he drives a conical wedge into the anchorage cone and cuts the strand. Meanwhile, the rabbit returns to the anchorage end of the bed.

Two small dump trucks carry loads of 2 cu yd from a central mixing plant about 1,000 yd away, and dump them into a 1-cu-yd hopper. The monorail-mounted hopper conveys the concrete mix from either side of the gantry and feeds the machine from the top.

Three hoppers in the machine place the concrete in layers. The front hopper deposits 1½ in. of lightweight mix with expanded shale aggregate around the prestressing strands. The middle hopper deposits concrete in the central core section. Finally, the rear hopper places a standard-weight mortar mix for the top surface about ½ in. thick.

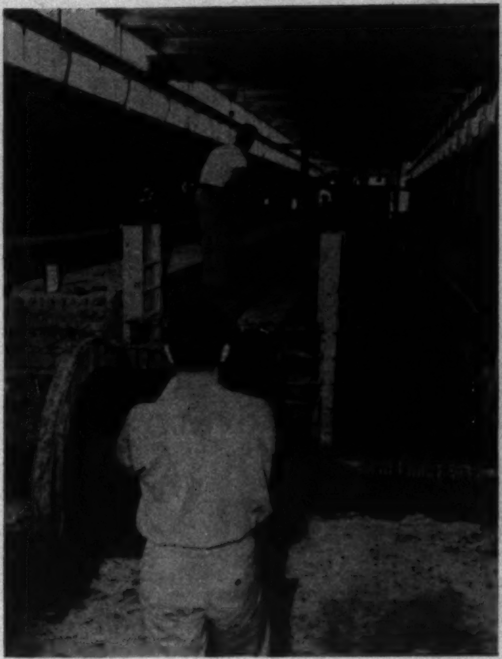
High-early-strength cement produces a 5,000-psi concrete in 7 days.

While the hoppers deposit concrete, strike-off bars level the concrete layers, and slipforms shape the grooved sides of the plank. Reciprocating tampers compact the concrete in each layer, taking the place of vibrators. A weaving screed strikes off a smooth top surface.

A set of mandrels, linked so that adjacent mandrels advance alternately through the mix, form the cores. The stiff mix holds the shape of the core walls and the plank edges. Mandrels for the 6- and 8-in. plank are elliptical in cross section. They are circular for the 4-in. plank.

To cure, workmen soak the top surface of the plank two hours after casting and keep it wet three days. A hose, with feeder lines for each core branching from a header, floods the cores one day after casting in moderate and cold weather when plant temperatures are below 70F or so. In hot weather, faster concrete setting requires earlier flooding.

Plank is ready for sawing three days after casting. After the strand anchorage is released, a saw operator rolls his electric-powered rig down the plank to the cut marks and saws it. Then a lifting rig, hung from an overhead

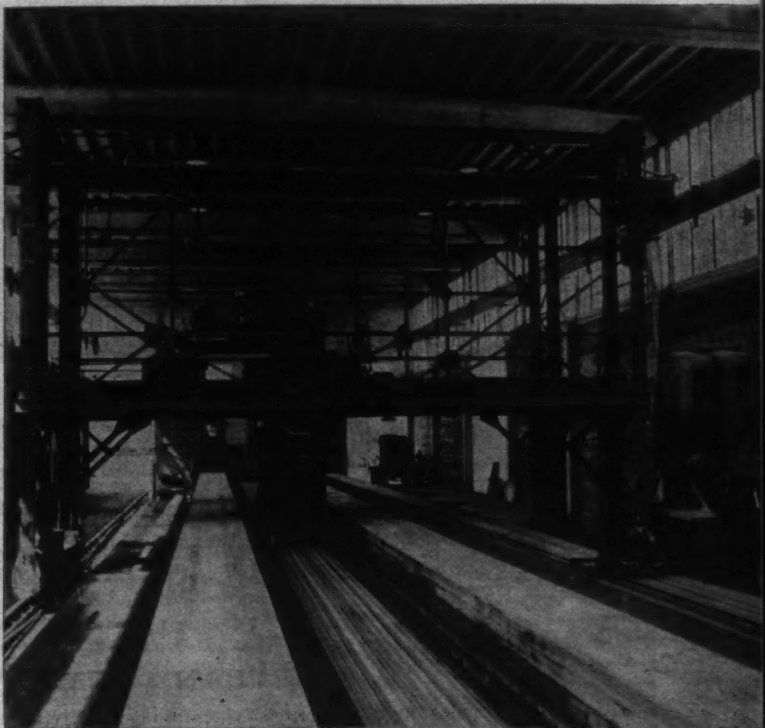


"Rabbit" takes strand from anchorage . . .

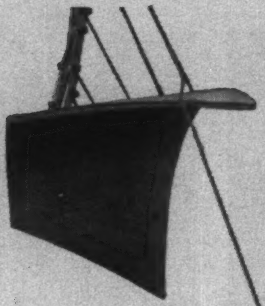
to prestressing end for automatic tensioning.

Use of Prestressed Concrete

Machine template positions tendons.

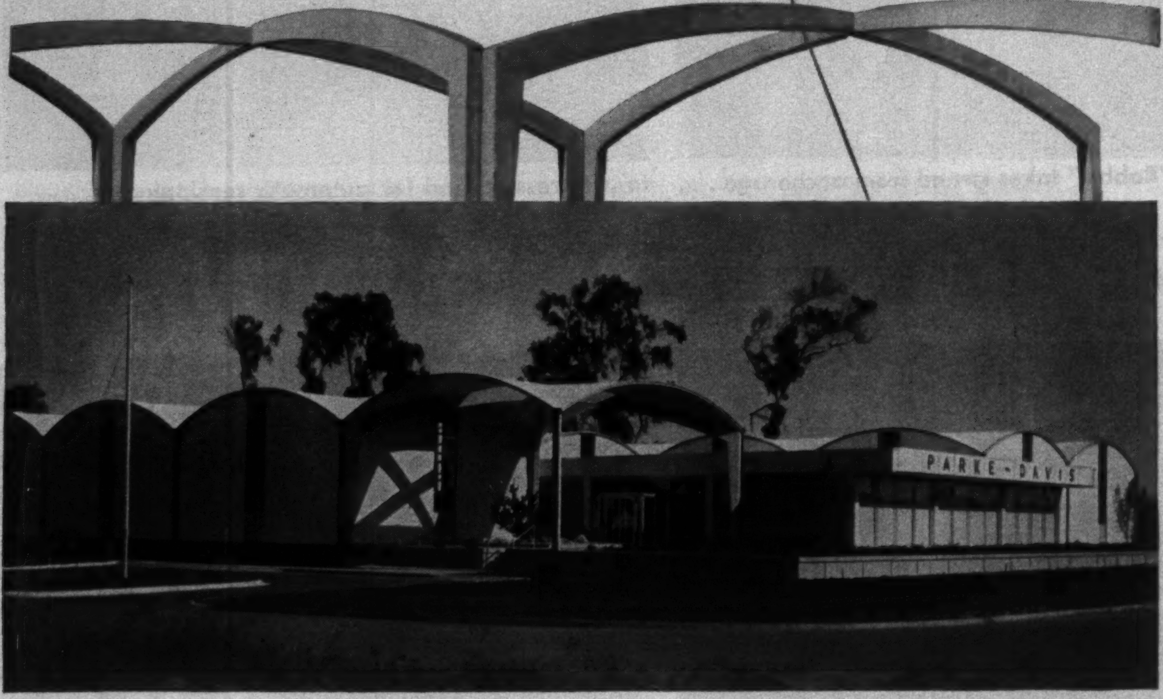


Gantry moves concreting machine at speed of 5 fpm.



Parke-Davis building
at Menlo Park...

jaunty "showcase" assembled from just 3 basic shapes in precast concrete



Beauty is good public relations, agreed officials of Parke, Davis & Company in planning this combination office and warehouse in a restricted industrial area in Menlo Park, Calif. To achieve this beauty, and fill practical needs as well, concrete was chosen for the whole job.

Shell-roof sections, L-shaped bents and wall panels were all precast, quickly and easily assembled on the job site. The results: a graceful, pleasing silhouette; the wide-open, fire-resistant interior specified; and a clean, modern look that suits a maker of pharmaceutical products.

Architects: Minoru Yamasaki & Assoc., Birmingham, Mich. Associate Architects: Knorr-Elliot Assoc., San Francisco, Calif. Structural Engineers: Ammar. & Whitney, New York City.

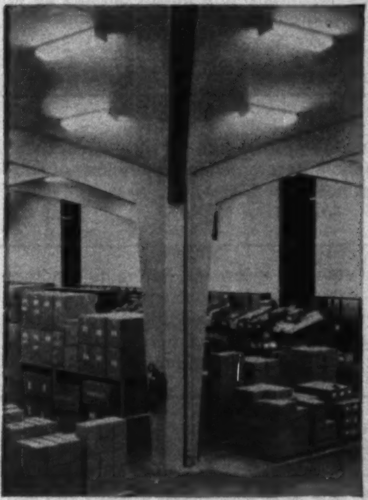
FOR STRUCTURES...
MODERN
concrete

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

Concrete shell roofs are money-savers for wide spans

Thinner by far than an eggshell in thickness to span ratio, concrete shells give big material savings, low cost. Domes, barrels, folded plates, hyperbolic paraboloids are all shell forms that easily achieve large, unobstructed floor areas. Shells can be pierced for skylights, support heavy machinery suspended from them.



Precast concrete units cut on-the-job building time

For the Parke-Davis job, bents were stack-cast, locked together diagonally to form 40-ft. square bays. Lightweight concrete was used for the prestressed wall panels and for the shells. Multiple use was made of all forms.

For free literature ***on shell construction (distributed only in U.S. and Canada) write to Portland Cement Association, Dept. 5d-17, 33 West Grand Ave., Chicago 10, Illinois.***

Water-cooled power saw cuts planks to exact length before . . .

. . . lifting rig hung from overhead crane loads trailer truck.

crane, grips the grooved edges of the plank with special tongs and swings it onto a trailer truck in an exterior aisle. From here the plank goes to a stockpile in the yard.

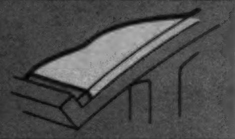
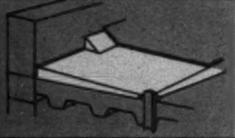
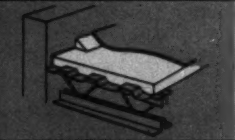
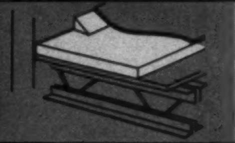
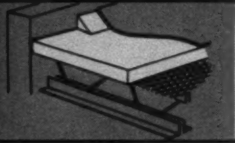
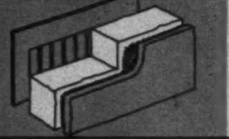
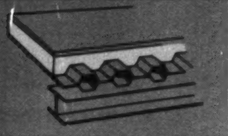
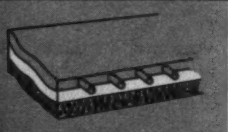
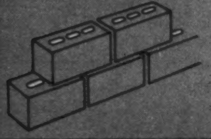
Strongest 8-in. plank spans 32 ft for floors, 36 ft for roofs. Several prestressing strands are placed in the top of each 40-in.-wide plank to resist erection stresses. Ultimate strength of the twisted, seven-wire strands is 250,000 psi; initial prestress, 150,000 psi.

Engineers of Formigli Corp., Philadelphia, the plant owner stacked the 8-in. plank horizontally on edge to form the building's exterior walls, spanning the 24 ft exterior bays.

West Allis Concrete Co., Milwaukee, Wis., holds the American rights to the concreting machine. W. Schaeffer of Heidelberg, Germany, perfected the machine shortly after World War II. Formigli has the first U. S.-built machine, although a German prototype has been in use since 1955 in a smaller U. S. plant in Waukesha, Wis. (ENR Nov. 24, 1955, p. 40).

Operations at the Formigli plant in Williamstown, N. J., are directed by Robert Stoelker, chief engineer.

NEW USES FOR

APPLICATION		ADVANTAGES
❶ THIN SHELL ROOF STRUCTURES Fill over Hyperbolic paraboloids, folded plate, etc.		Permalite-aggregate concrete insulation is easily placed on curved and/or sloped surfaces. On many roof shapes, this is only type of insulating material which can be applied.
❷ ROOF INSULATION Drainage Fill over Structural Concrete		Cuts labor costs, since structural deck does not need finished surface. Permalite concrete can be sloped to drain in same operation which provides insulation. No additional insulation needed.
❸ LIGHTWEIGHT ROOF DECKS Fill over Corrugated Steel Deck		Poured monolithically over galvanized corrugated steel sheet welded to structural supports. Low in cost, very strong, suited to wide spans or where high load carrying capacity is required. No additional insulation needed.
Roof Deck over Formboards		Permalite insulating concrete offers weight savings up to 4 lbs/ft² over other poured-in-place decks of comparable insulating value.
Roof Deck over Metal Lath or Wire Mesh		Low in cost. Combines permanence, light structural strength and insulation. Recommended where joist or sub-purlin spacing does not exceed 36″.
❹ CURTAIN WALLS Sprayed-in-Place Backup Walls		Easily applied with standard machines. Permalite concrete sprayed in place has compressive strength of 1000 to 2000 psi—ample to withstand windload. High heat capacity. Fire retardance—up to 4-hour fire ratings. Thermal insulation without vapor condensation problem.
❺ FLOOR FILL		Permalite concrete fill over cellular steel or other structural floors permits substantial reduction in dead load. Terrazo or ceramic tile may be installed directly over Permalite fill. Blends of Permalite and other aggregates provide stronger fills for use under asphalt tile or similar surfaces.
❻ SLAB ON GRADE		Sub-slab of Permalite insulating concrete under radiant heating systems in slab on grade can reduce heat loss by 25 percent.
❼ CONCRETE BLOCK INSULATION Loose Fill		Permalite expanded perlite, poured as loose fill in the core spaces of lightweight concrete block, increases thermal insulation by 50 percent.

LIGHTWEIGHT CONCRETE

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Lightweight concrete mixed with Permalite expanded perlite as the aggregate has these major advantages.

Insulation. Provides up to 20 times the insulation of ordinary concrete. Two inches of Permalite concrete offers more insulation than 1" of most insulating boards. Insulate roof deck and slope to drain in same operation.

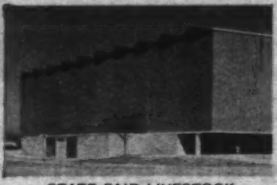
Light Weight. Weighs from 22 to 36 lbs/ft³, with compressive strengths of 95 to 440 psi. Permalite-sand blends, or machine-applied Permalite concrete, have strengths of 1,000 psi or more.

Cost Savings. Combine roof deck and insulation in one easy-to-place slab. Lower deadload permits lighter beams and joists. Incombustible deck offers insurance savings.

Other Features. Fire-safe. Can't rot or decay. Termite-and-vermin proof. Not damaged by water. Easily placed on flat, curved or pitched surfaces. Can be job-mixed, transit-mixed or precast. Can be worked with ordinary carpenter tools.

BANK OF THE SOUTHWEST BUILDING, Houston, Texas
Sprayed-in-place Backup Wall

UNITED NATIONS GENERAL ASSEMBLY BUILDING
Roof Deck Insulation



STATE FAIR LIVESTOCK COLOSSEUM, Dallas, Texas
Roof Insulation on Long Span Self-Bracing Trusses

HOW LIGHT IS "LIGHTWEIGHT" CONCRETE?

Weight Class	Aggregate	lbs/ft³	"k" factor
Light	Permalite	22–36	0.51 to 0.77
Medium	Expanded slag, shale or clay	60–120	1.7 to 5.2
Heavy	Sand and gravel	140–150	9.0

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THE LARGEST-SELLING PERLITE AGGREGATE IN THE WORLD

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For the full story, see your Sweet's File, or check with your nearest Permalite franchisee, listed below. Permalite aggregate is produced exclusively by these licensed franchisees from perlite ore mined by Great Lakes Carbon Corporation.

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EN-2

SYMONS® CONE CRUSHER AIDS WATER DIVERSION PROJECT

. . . produces over 100,000 tons of granite gravel with original crushing members

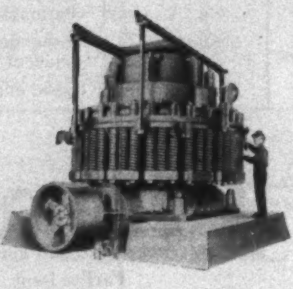
Shown "on location" in scenic Colorado, this 3-ft. Symons Standard Cone Crusher is doing an outstanding job of producing aggregate for a 23-mile long tunnel to divert some 500 million gpd of western slope water out of the Blue River to the eastern slope of the Continental Divide.

Operated by Blue River Constructors, in a crushing plant designed by Brown and Root, Inc. of Houston, this sturdy crusher has produced more than 100,000 tons of tough granite gravel, with the original crushing members.

This is another good example of the dependable performance that contractors and producers have learned to expect from Symons Cone Crushers, in both stationary and portable service.

Write for literature.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin



SYMONS® CONE CRUSHERS

. . . The machines that revolutionized crushing practice . . . **are built in a wide range of sizes, for capacities to over 900 tons per hour. Write for descriptive literature.**

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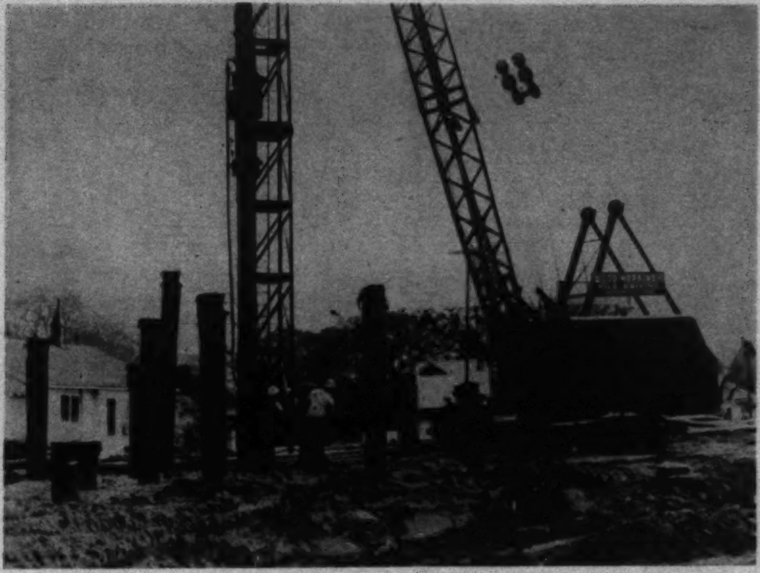


Treated Timber Piles Support . . .

. . . Concrete Highway Pavement

A 700-ft-long section of four-lane concrete pavement supported on treated timber piles is nearing completion near St. Augustine, Fla. Engineers designed it as a 10-in. flat plate slab. It consists of two 12-ft lanes in each direction with a raised concrete center median of variable width (up to 18 ft).

The pavement closely parallels tracks of the Florida East Coast Railway, which is on a fill. Underlying the surface sand and the railroad fill is an 18-ft-thick deposit of muck (A-8 soil), which could not be removed because of the possibility of damage to the railroad embankment. Hence, the unusual use of pile foundations.

First step in construction of the new road was removal of the old pavement and existing storm sewer. The contractor then placed the new embankment. Composed of sandy soil, the fill ranges in height from 4.5 to 5.5 ft above the natural ground surface.

Wood Hopkins Construction Co. of Jacksonville drove treated timber piles through the fill to a minimum bearing of 18 tons each. Piles range in length from 30 to 60 ft. After driving, workmen cut off the tops of the piles to extend 2 in. into the bottom of the concrete slab.

The contractor shaped the subgrade to the required cross section and compacted it. Before the concrete was placed, a ¾-in. by 12-in. steel dowel was driven vertically 6 in. into each pile top.

The pile-supported length of road is made up of approximately equal lengths of tangent and a circular curve. At one end is an access road to abutting property; a similar intersection on the same side occurs about mid-length. To meet these conditions, designers divided the pavement into 24 longitudinal units with varying overall dimensions, pile patterns and quantities of reinforcing steel.

The plan shown on p. 42 is typical of the tangent sections. Thirty-two piles—arranged in four rows of eight piles each—support the road slab. Engineers designed the slab and its foundation for H20-S16-44 loading.

Designers provided doweled expansion joints between adjacent slabs and at intersections. Each expansion joint consists of ½-in. premolded filler extending the full depth of the slab. Dowels are ¾-in. plain steel bars 1 ft 6 in. long, spaced 1 ft 6 in. c-c. Dowels are bonded to the concrete on one side of the joint; the other end fits into a crimped metal tube about 6 in. long. The length of the dowel between the cap and joint filler is wrapped with paper to prevent bond. Edges of the joint were rounded to ¼-in. radius and the top ¾ in. of the joint filled with poured rubber joint sealer.

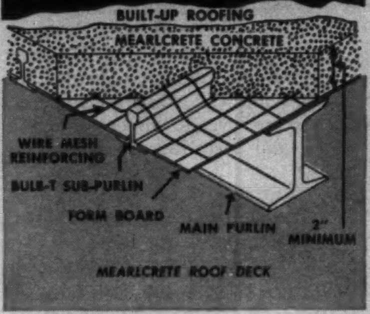
The prime contractor—James H. Craggs of Gainesville, Fla.—elected to build the roadway in two strips, about one-half of the total pavement width at a time. This procedure required a longitudinal construction butt joint, with reinforcing bars overlapped. Specifications called for the bars to be overlapped a minimum distance of 1 ft 6 in. Workmen formed a ¾-in. by ¾-in. groove with rounded edges immediately above the butt joint. Except beneath the raised concrete median, the surface groove was filled with poured rubber joint sealer.

On one side of the first slab, the contractor cast an integral curb and gutter.

The raised center median is quite low, about 3 in. in height at the center. Median reinforcement consists of ½-in. bars spaced 18 in. c-c both ways. It is tied to the underlying slab by bent ½-in. bars spaced 18 in. c-c in the longitudinal direction; these bars are placed near each edge of the median. The horizontal leg of each bar is about 1 ft 6 in. long and the vertical leg about 9 in. long, extending down into the roadway slab about 7 in.

Longitudinal reinforcing in the sec-

MEARLCRETE
insulating
ROOF DECKS


BUILT-UP ROOFING
MEARLCRETE CONCRETE
WIRE MESH REINFORCING
BULB-T SUB-PURLIN
FORM BOARD
MAIN PURLIN
2" MINIMUM
MEARLCRETE ROOF DECK

fast

Place up to 30,000 square feet of roof deck or insulation in a single day.

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Permits savings on structural steel frame!

economical

Competitive with all other systems!

Pumped into place as insulating fill on galvanized corrugated steel decks, or as roof decks on form boards, Mearlcrete Foam Concrete offers many advantages over other systems. Here are a few:

CONTROLLED QUALITY — Mearlcrete is installed only by franchised trained contractors.

INCOMBUSTIBLE — 100% concrete reduces heat flow and flame spread.

LOW WATER CONTENT — Less than other poured decks:..dries rapidly... pemits faster construction schedules.

HIGH INSULATING VALUE — Reduces initial cost and operating cost of heating and cooling plant.

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with complete data on Mearlcrete Foam Concrete and the name of your local Mearlcrete contractor.

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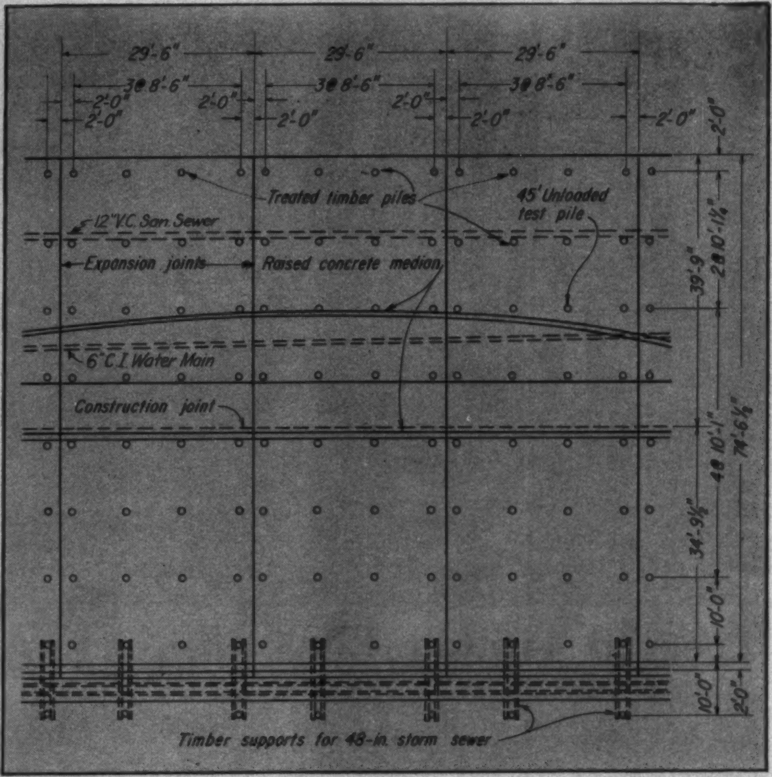

29'-6"
29'-6"
29'-6"
3@ 8'-6"
3@ 8'-6"
3@ 8'-6"
2'-0"
2'-0"
2'-0"
2'-0"
2'-0"
2'-0"
2'-0"
2'-0"
Treated timber piles
45' Unloaded test pile
12" V.C. San. Sewer
Expansion joints
Raised concrete median
6" C.I. Water Main
Construction joint
Timber supports for 48-in. storm sewer
2@10'-1¼"
39'-9"
4@ 10'-1"
74'-6½"
34'-9½"
10'-0"
10'-0"
2'-0"

TYPICAL PAVEMENT section is designed as flat plate floor slab.

tion shown is composed of ⅝-in. round bars spaced about 5½-in. c-c on both top and bottom. Transverse reinforcing is made up of ¾-in. round bars at the same spacing, both top and bottom. Quantity and pattern of distributed reinforcing are generally the same in other units.

Ironworkers placed the distributed reinforcing steel, which was supported by bar chairs on the subgrade. Southern Materials Co. of Jacksonville supplied concrete from a temporary plant. Concrete slump was 2 to 3 in.

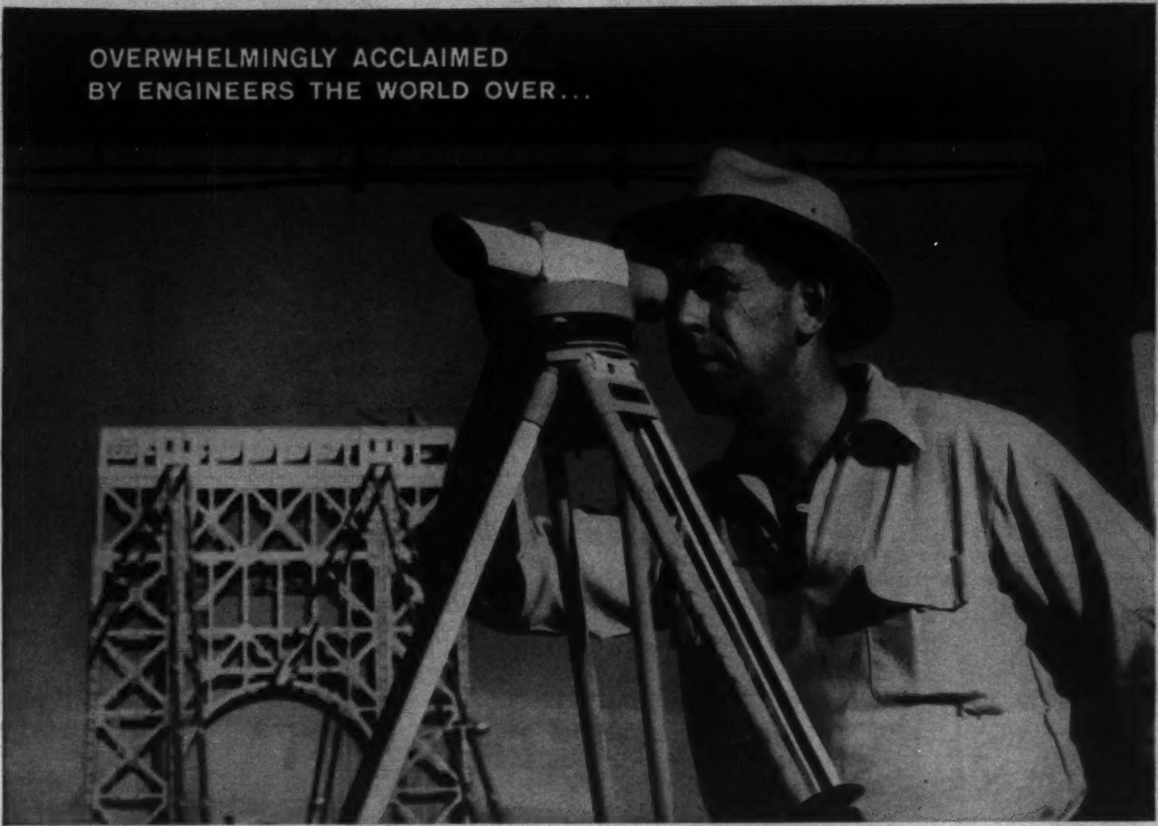
Heavy equipment usually employed to spread and finish concrete on paving jobs could not be used on the pile-supported section. The contractor used a 34-ft vibrating screed with adjustable crown and twin gasoline engines. Concrete was placed and hand distributed to the approximate height of the forms. Workmen then pulled the vibrating screed, supported by rollers at each end, over the fresh concrete. Final step was a light broom finish.

A 48-in. precast concrete storm sewer runs along one side of the pile-supported slab. This line is supported by treated timber members bolted to parallel rows of treated timber piles. One line of piles is the outside row supporting that edge of the roadway. The other row is parallel 6 to 8 ft away.

Principal transverse supports for the concrete pipe are 6x12-in. timbers. A pair of timbers connects each pair of piles, one timber on either side. Cradle for the pipe is made of 4x8-in. and 4x10-in. timbers. A rubber gasket type of joint was used in the sewer line.

CONCRETE STORM SEWER is supported by cross members bolted to piles.

Work is being supervised by the Florida State Road Department. Richey Green is District Engineer; W. L. Stanton, Project Engineer.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For 7 years now, in U.S. and Canada, contractors of every size, industrial, government and military field men have *tried* and *proved* the Zeiss automatic level (K&E NP5028). They all concur: it's faster to use, far simpler . . . and far more accurate.

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A book could be written about the success stories of this remarkable instrument. As a matter of fact, one has been . . . a fascinating collection of case histories from around the world. The book is full of worthwhile tips and techniques. It's free, and a copy can be yours in a week or so, if you write for it, today.

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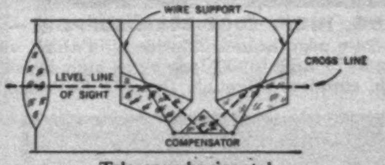
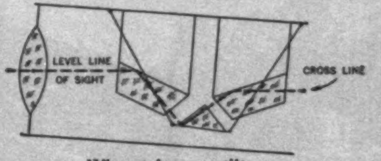
ZEISS
LEVEL

How does the Ni 2 work?

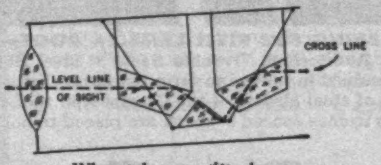
A *built-in compensator* . . . a lower prism suspended by specially treated fine wires . . . *automatically maintains a level line of sight* through the pull of gravity, as these illustrations explain.


WIRE SUPPORT
LEVEL LINE OF SIGHT
CROSS LINE
COMPENSATOR

Telescope horizontal


LEVEL LINE OF SIGHT
CROSS LINE

When telescope tilts up, compensator swings backward


CROSS LINE
LEVEL LINE OF SIGHT

When telescope tilts down, compensator swings forward

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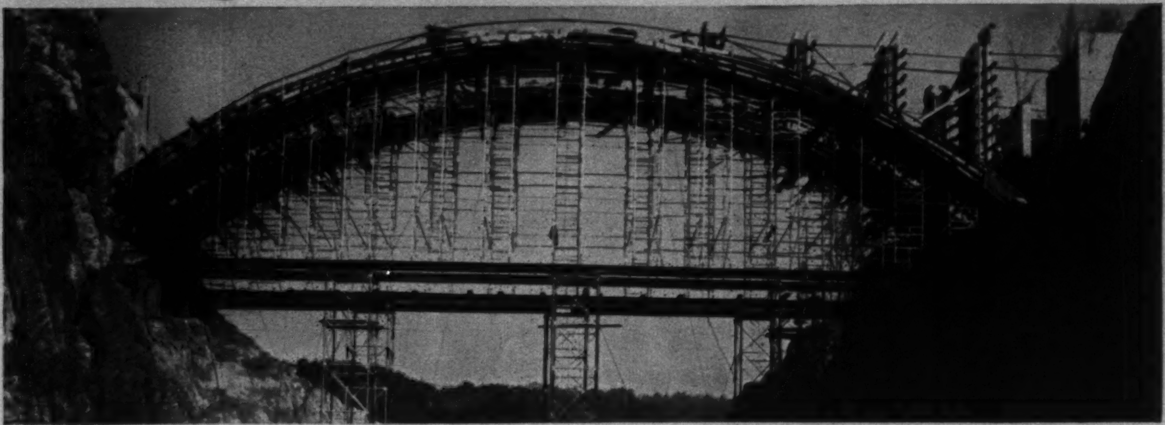
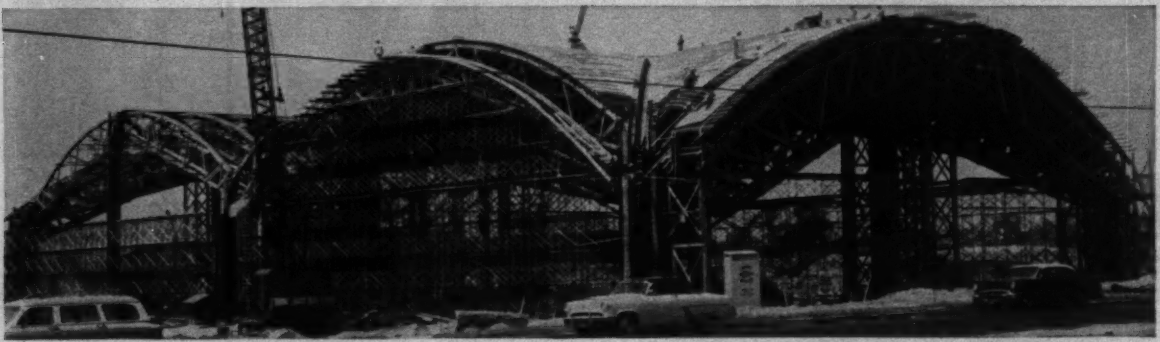
Shoring Methods . . . by PS CO.



TWO-UP SHORING FOR HEAVY BRIDGE—For the new, 143′-long concrete bridge at Hogback Dam, Riverton, Conn., PS CO. Extra Heavy Duty Shoring is first assembled in 6 towers, 48′-high to carry a total load of 32,000 lbs. per leg. I-beams are set on top. Then "Trouble Saver"® 4′-wide Heavy Duty Shoring frames are arranged atop the I-beams. Frames support 9,000 lbs. per leg, imposed by columns and two ribbon arches 8′-wide by 1½′ to 3′-thick, 34′ center height. White Oak Excavators, contractor.



LONG, HIGH, EDGE-BEAM SUPPORT—Shoring of long, concrete edge-beams, 22″-wide by 4′-thick, varying from 140′ long by 70′ high to 150′ long by 75′ high, is easily accomplished with standard "Trouble Saver"® Sectional Steel Shoring. Frames of various heights are used to match the curve of the beams. Gilbane Building Company, contractor, for the first fully mechanical Post Office, Providence, R.I. Building is to be 420′ by 300′.

CRIBBING FOR STEEL LAMELLA ROOF—For the Ladue H.S. Auditorium, "Trouble Saver"® Steel Shoring is rapidly assembled in towers to form temporary cribbing during erection of steel girders of the lamella-type roof. Shoring towers, with frames spaced 5′ apart, are placed to hold girders during positioning by one crane. Workers secure opposite ends to adjoining members already placed. Steel arches are 252′-long, abutment to abutment, center height 50′. Christina Constr. Co., gen. contr., Kroeger Erection Co., steel erectors.

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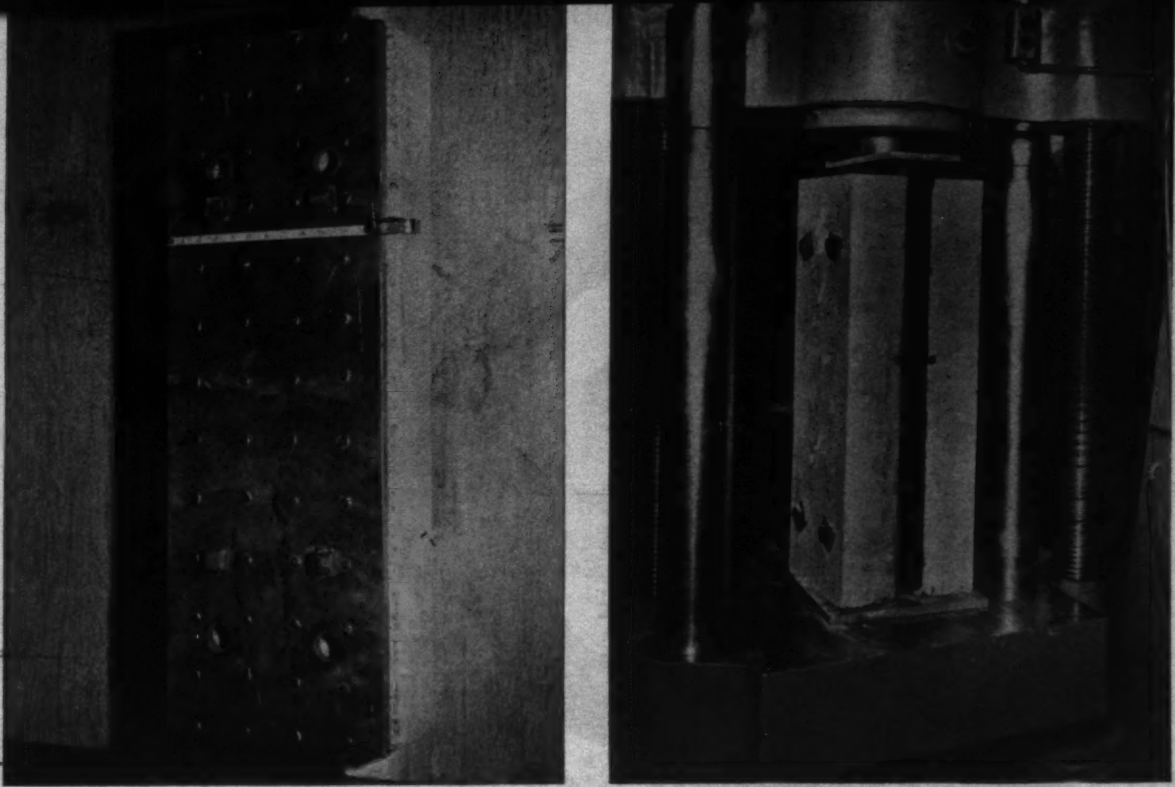
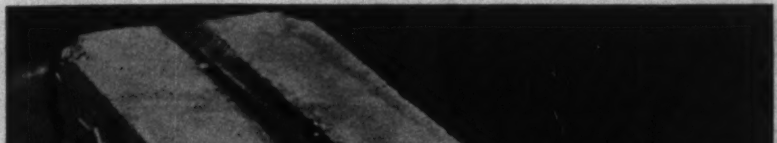


WELD BEADS prove adequate in shear transfer between steel plate and concrete slabs in tests on composite construction.

Shear Transfer Can Be Simple



FAILURE OCCURRED in this specimen by bowing of the steel plate. The specimen was carrying 290,000 lb when the steel bowed. There was no actual shear failure.

By Homer M. Hadley

Exploratory tests have demonstrated that shear transfer to provide composite action between steel beams and concrete decks on bridges and buildings can be relatively simple. Beads or buttons of weld metal provided unit shear stresses in excess of 400 psi.

These beads are much simpler than vertical plates attached to the top flange of the beams. And they are in sharp contrast with bristling forests of rod-type shear connectors used by some designers.

The exploratory test resulted from a recent bridge design that combined precast concrete slabs with steel wide-flange beams. The designer believed that shear transfer could be made simple. But proof—not opinion—was needed to justify design. Accordingly, arrangements were made with Prof. Holger Mittet to conduct exploratory tests at the University of Washington. Results were completely satisfactory.

The test plan was to sandwich a steel

Mr. Hadley, a leading structural engineer in Seattle, Wash., has designed many bridges and buildings in the Pacific Northwest. Before opening his consulting office, he was with the Portland Cement Association.

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architectural concrete

Contemporary architecture as evidenced in Atlanta's beautiful Lenox Square Shopping Center often demands the smooth flowing lines made possible with reinforced concrete. Connors supplied reinforcing steel, fabricated to order, for some of the major buildings in this development. With many years experience in the fabricated reinforcing steel field, Connors can be depended upon for complete detailing, accurate fabrication and as-scheduled delivery. Bars arrive at your site bundled and tagged for quick placement.

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plate with slightly roughened sides between two precast concrete slabs, also with roughened sides. The slabs were separated from the plate by ¾-in. layers of 1:1½ mortar. Load was applied to the projecting upper end of the plate. This load would be transferred in bond or vertical shear to the concrete slabs, which alone would bear upon the bed of the testing machine. Two such specimens were made and tested.

Small welded beads, or buttons, were formed on a 3x2¾-in. pattern on both sides of the 12x36x¾-in. plates. These were created by bringing a 3/16-in. bare welding rod to contact and depositing a blob of metal, about ⅛ in. high and ⅜ in. in diameter.

To control thickness of mortar layers, four small spacer blocks, 1x1x¾ in., were tack welded to each face of the plates. (Note that these blocks are not shear connectors.)

Maximum mortar thickness was controlled with four ¾-in.-dia bolts with small plate washers that were passed through each specimen and lightly snugged into position.

The mortar space was sealed along the sides by 1x1-in. felt strips glued to the edges of the steel plates. And a 1x2¼-in. wood strip (later removed), on which the steel plate was seated, closed off the bottom of the mortar spaces. These spaces were then filled with early-strength cement mortar.

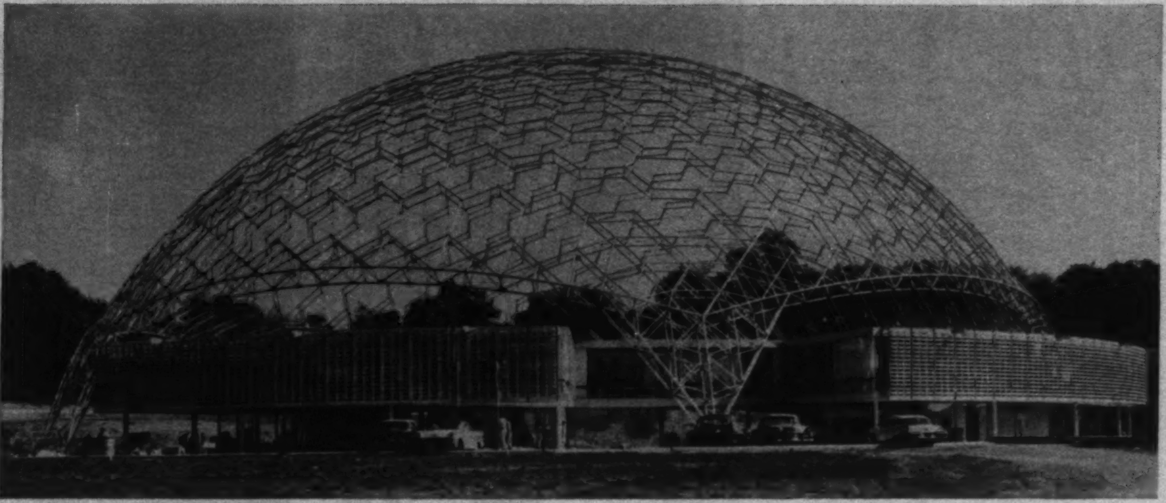
The surfaces of the concrete slabs coming in contact with the mortar were cast against forms that had been painted with a sugar solution. On removal of forms these surfaces were wire brushed, exposing the aggregate. There were no shear keys.

The steel plates projected 1 in. above the top of the slabs and terminated 1 in. above the bottom of the slabs. In this position, the ¾-in. bolts, passing through 1¼-in. holes in the plate, were out of contact with the plate.

During the test, one of the specimens sustained an axial load of 300,000 lb and failed in the bottom concrete, due to slight irregularities in bearing. The other was carrying just over 290,000 lb when suddenly it refused to take more load.

In this case, the steel plate, at yield point, bowed at the top and broke off the upper corner of one of the slabs. Again, there was no shear failure. With maximum loads distributed over a total area of 700 sq in. (twice 10x35 in.), the unit shears were 429 and 414 psi, respectively. Limiting shear values would, of course, be somewhat less.

This type of connection—with hold-down bolts—was used for the Upper Baker River Bridge (ENR Jan. 28, p. 42). Test loading indicated quite conclusively that composite action of an effective nature was being obtained.



Ultramodern ASM headquarters at Metals Park, Novelty, Ohio demonstrates geodesic dome construction. *Architects:* John Terence Kelly, Cleveland, Ohio; *General Contractor-Engineering:* Gillmore-Olson Co., Cleveland, Ohio; *Electrical Engineers* (Plans & Specifications): John Paul Jones, Cary & Millar, Cleveland, Ohio; *Electrical Sub-Contractor:* Doan Electric Co., Cleveland, Ohio.

Nepcoduct fits the job perfectly at ASM's New Geodesic Dome Headquarters

Continuous curve of building posed unusual problem in installing underfloor raceways.

To provide complete electrical flexibility, underfloor raceways were specified for American Society for Metals' ultramodern National Headquarters building at Novelty, Ohio. But they had to conform to the continuous curve of the semi-circular building. "Nepcoduct" fit the job perfectly without the use of elbows or special fittings—which meant economical installation. National Electric's "Nepcoduct" Underfloor Raceway was the up-to-the-minute answer to a very new problem in electrical construction.

"Nepcoduct" Underfloor Raceways are but one of a complete line of modern underfloor and surface electrical distribution systems available from National Electric. For complete details, write to *National Electric Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

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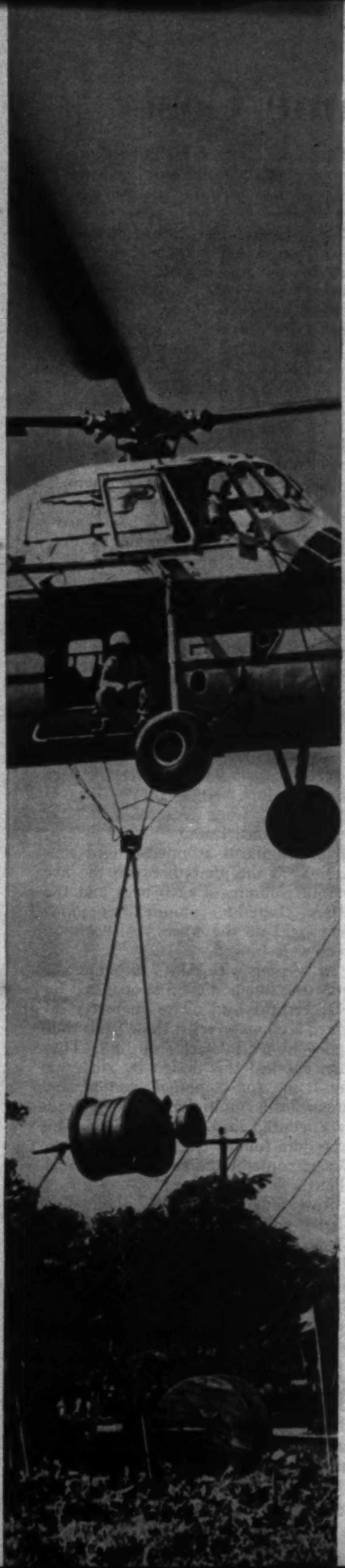
In the mountains of Puerto Rico, work crews once needed three to four months to plant 100 poles... now one crew plants 100 poles in one day with just one Sikorsky helicopter

1

2



3

Power line construction in Puerto Rico is tough work. Pole-planting crews of the island's Water Resources Authority must slash through thick tropical vegetation, push across mountainous terrain. They fight against time and nature. And now they are licking both with an S-58 Sikorsky helicopter.

Last Spring, the Authority bought the S-58 after earlier successful experiments with that machine. When the S-58 was in full-time use for only 10 months, time and money savings had paid off its cost in full. Now the Authority estimates that, with the copter, it can complete a full year's pole-setting program in a period of only three months.

Money savings? "Conventional transmission line pole-setting costs us from $120 to $380 per pole, depending on the terrain," reports Rafael R. Ramirez, the Authority's assistant executive director. "With the helicopter, these costs come down to $35 to $75 per pole"... savings of 70% to 80%.

Can your business use a Sikorsky helicopter to make a tough job easier, do it faster—and save money? We'll be glad to supply more facts and discuss the possibilities with you.

1

AGILE AS A HUMMINGBIRD, the S-58 Sikorsky helicopter hops from the staging area to pole sites, transporting and setting rural electrification poles like this one weighing 1,300 pounds. The S-58 will transport and plant them at a rate of 20 an hour—100 in a full working day.

2

PAUL BUNYAN WAS A PIKER compared with this S-58 Sikorsky. The 65-foot, 3,750-pound transmission line pole it has lifted to the top of a Puerto Rican hill is guided into place by a two-man ground crew. Minutes later, the helicopter will be back with a second pole to make the H-frame structure. Then it will transport and set the crossarms weighing 3,300 pounds.

3

SPECIAL DELIVERY—Into a tight spot the helicopter lowers a fresh reel of cable. The S-58 is used in the stringing operation, too. In one day, it can string a mile of transmission line, consisting of three conductor and two shield cables. Handled by manpower alone, the same job takes two weeks, *costs three times as much. The largest work done to date is 115 Kv on wood H-frame structures, 795 ACSR.*

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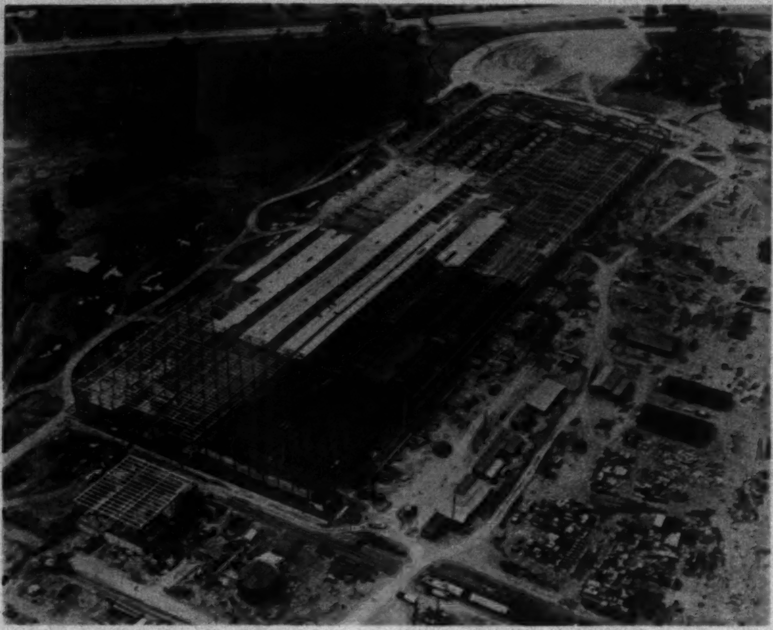
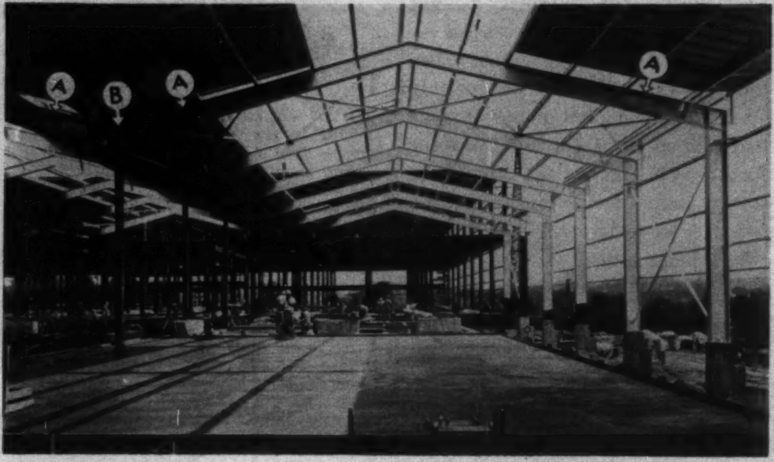
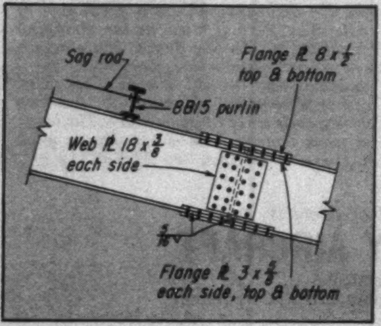


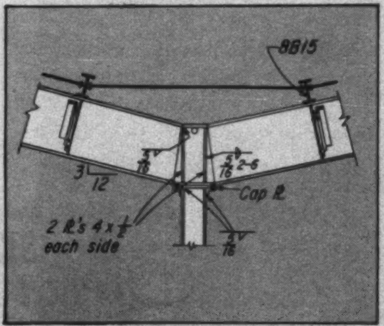
Rubber plant encloses 8-acre area with . . .



. . . plastically designed roof frames, saving 140 tons of steel.


Sag rod
Flange ⅊ 8 x ½ top & bottom
8B15 purlin
Web ⅊ 18 x ⅜ each side
5/16
Flange ⅊ 3 x ⅝ each side, top & bottom

A Typical frame splice requires 56 $\frac{7}{8}$-in.-dia high-strength bolts to transfer stress.



B Interior column-rafter connections require four $\frac{3}{4}$-in.-dia high-strength bolts.

The economies of plastic design in steel are dramatically displayed in a giant tire manufacturing plant in Nashville, Tenn.

Rust Engineering Co., designer-builder saved 140 tons of structural steel in the one-story, 352,000-sq-ft building, largest U. S. structure yet designed by plastic theory.

Each line of roof framing consists of six 60-ft spans of continuous gabled rigid frames. They frame across the 360-ft building, spaced 25 ft c-c typically for the 975-ft length. Rafter slope is 3 on 12.

Roof purlins are two-span continuous members at a maximum spacing of 6 ft. They carry 2 $\frac{3}{4}$-in. precast channel slabs with 1-in. web thickness.

Plastic design of a typical bent, carrying roof load only, resulted in 21WF68 rafters and exterior columns, with 8WF31 interior columns. In contrast, a conventional elastic design, limiting design tensile stress to 20,000 psi, (24,000 psi over continuous supports) required 24WF84 rafters and exterior columns. Interior columns remained 8WF31's. Weight savings in the frames thus averaged 19%.

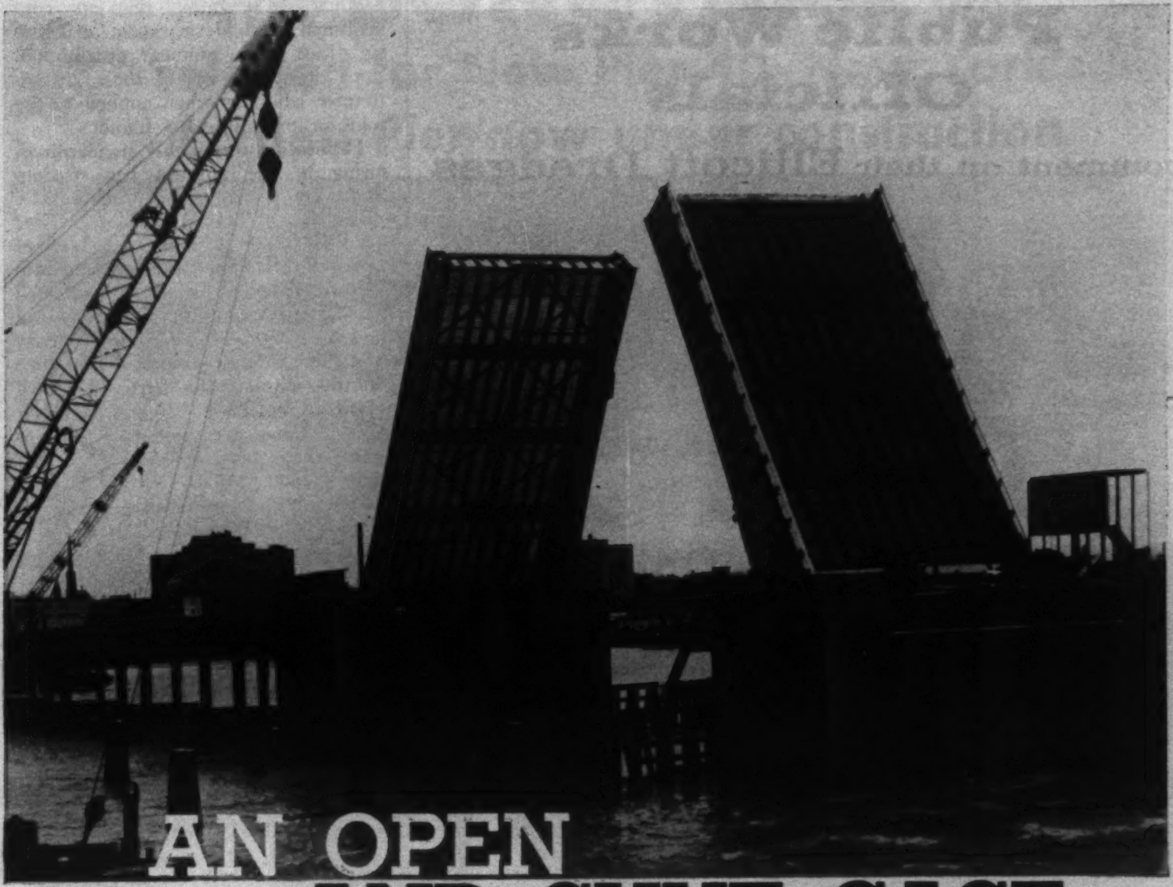
The designers suspended the toilet rooms and offices from the roof frames to keep the main floor area free. Heavier frame sections, either 21WF96's or 21WF127's, were required to carry these additional loads.

Rust engineers assumed hinged connections at the joints between the five interior columns of each bent and the rafters. Exterior column-rafter joints were rigid at the knees. All column bases were hinged.

In keeping with AISC recommendations, the frames were first analyzed for total vertical load. The engineers designed sections to resist these loads multiplied by a load factor of 1.85. They then checked this design by analyzing the frame for combined vertical and lateral load, multiplying design loads by a reduced load factor of 1.40. This procedure follows the Rules for Plastic Design contained in the AISC Manual, "Plastic Design in Steel."

Rust engineers made their final plastic analysis of the frame by the Mechanism Method. In this method, the designer first determines the possible failure modes, or mechanisms, of the structure. He then equates internal and external work for each mechanism (eliminating obviously false solutions) and solves the equations for plastic moment. The mechanism that gives the lowest value of plastic moment is the correct solution—ie., the mode of failure for the structure. This approach must be used for complex structures

Bascule bridge under construction near Charleston, S. C.



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for structural steel—and Ingalls

You don't see many bascule bridges being built today. But when you do . . . you'll see a structure of steel. Steel is a natural because it offers the strength plus versatility required in this type of construction. Steel makes sense in many other types of construction, too . . . particularly when it's fabricated by Ingalls. On your next job, specify this combination—"Structural steel by Ingalls."

Contractor: Diamond Construction Co.
Engineers: South Carolina Highway Dept.

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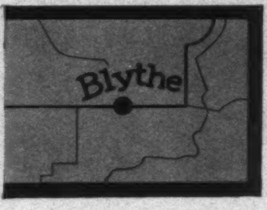
Mr. W. T. Eiffert, Director, Department of Water writes, "We have never received such a complete piece of equipment, nor have we ever received such complete training in the operation of a new piece of equipment."

Blythe, California

Mr. O. E. Simmons, Manager, Palo Verde Irrigation District says, "All checks indicate that the dredge is exceeding the specified capacity. Our operators frequently comment on the simplicity of operation and the small amount of effort required to handle the control system."



Yaphank, New York

Mr. Albert Cass, Commissioner of Public Works, Suffolk County reports, "The versatility of our Ellicott 12" hydraulic pipeline dredge 'Shinnecock' has made possible a wide variety of local development projects."

Customer statements from all parts of the country and the world testify to the excellent design, quality and performance of Ellicott dredges and the service that accompanies them. These remarks concerning both standardized "DRAGON" models and the heavy duty dredges have come from both public officials and private owners.

If you are considering the purchase of a dredge, we will be glad to tell you more about what other owners of Ellicott dredges say, and provide technical details. Write to Ellicott Machine Corporation, 1603 Bush Street, Baltimore 30, Maryland.

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Successors to the floating dredge business of the Bucyrus-Erie Company and the American Steel Dredge Co. Complete engineering, design and construction service.

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Marking Our 75th Year

that can't be solved by the other method of plastic analysis—the Statical Method. It is simpler than any conventional method of elastic analysis—e.g., least work, moment distribution, slope deflection. All of these are extremely laborious when applied to the solution of multi-span frames.

Fabrication was highly standardized, owing to the uniform bay spacing. Splice points on the rafters are equally spaced from column center lines. They occur at, or very close to, points of minimum bending stress. Each continuous six-bay section was shop-welded as 18 units, comprising six identical inverted V-rafter members, five interior V's, five interior columns, and two exterior column-rafter partial Y's. All 17 field connections required for each six-span frame were bolted. This eliminated the expense of bringing welding equipment onto the jobsite. High-strength bolts, $\frac{7}{8}$ in. in diameter, connected flange and web plates at rafter splice points to provide full moment, axial load and shear transfer.

Three crews, each working with a crane, erected the entire 1,745 tons of steel in 35 working days, averaging 17 tons per crew daily. Eight two-man bolting teams made the permanent field connections. Three other crane-crews unloaded and sorted steel as trucks arrived on the site from the fabricator's plant.

The erection crews worked down one side of the building from exterior, erecting three spans of each continuous six-span frame. After completing the first side, they erected the three remaining spans on the other side of the building, working from interior to exterior this time.

Proper guying of the frames, with all column bases hinged, was essential. Both exterior columns in each continuous frame had to be in place to provide lateral stability before the roof plank was installed.

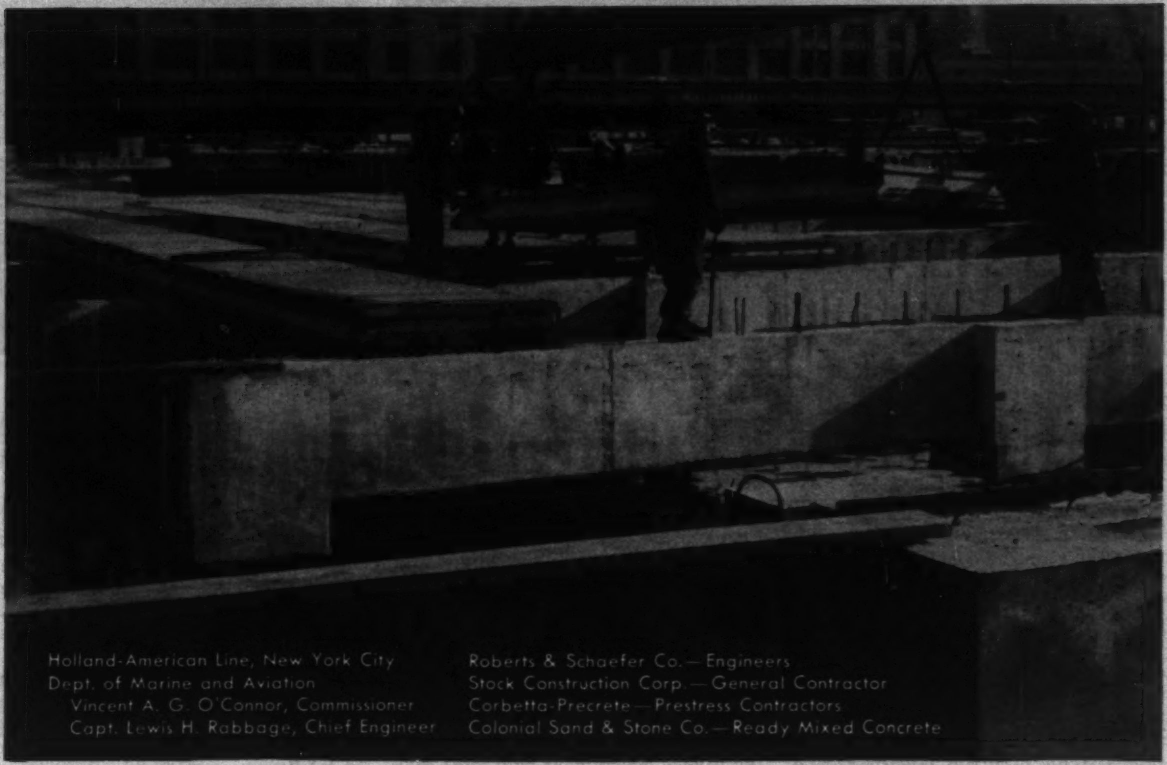
Steel crews erected the lightweight, 50-ft-long 8B15 purlins with a special rig to prevent buckling of the slender members as they were lifted. The guying cables bracing the frames made stacking difficult in the 25x60-ft bays. But the weight saving over simple-span purlins more than offset the slightly increased erection cost.

The designers provided two expansion joints, dividing the building into three sections ranging from 300 to 350 ft long. Double frames, spaced two ft apart, occur at these joints.

Decatur Iron and Steel Co. of Decatur, Ala., fabricated the structural steel.

The American Institute of Steel Construction reviewed design calculations for conformity with the Rules for Plastic Design, which at the time had not been published.

Why **SONOTARD** was selected for New Pier 40; New York's Largest Pier now under construction



Holland-American Line, New York City
Dept. of Marine and Aviation
Vincent A. G. O'Connor, Commissioner
Capt. Lewis H. Rabbage, Chief Engineer

Roberts & Schaefer Co.—Engineers
Stock Construction Corp.—General Contractor
Corbetta-Precrete—Prestress Contractors
Colonial Sand & Stone Co.—Ready Mixed Concrete

- **SONOTARD** is being used in *all* concrete to produce consistent and uniformly high strengths required for the heavy live loads to be handled, plus maximum density to resist erosion from sea water.
- A high degree of workability to facilitate placement has been maintained through high summer heat and a winter which recorded a low mark for sustained cold weather.
- The quantities of **SONOTARD** used were varied according to temperature to keep the water content and rate of hardening constant. At all temperatures **SONOTARD** produced a uniformly high strength with maximum density and eliminated shrinkage and cracking.
- **SONOTARD** played an essential role in the prestressed deck slabs and beams by controlling the initial rate of hardening and fluidity of concrete for optimum placement properties.
- **SONOTARD** speeded the strength development (15 hours of steam cure averaged over 4500 psi) permitting early release of tension and early stripping of forms.
- Since **SONOTARD** does not increase the air content while reducing water requirements it allows the operator to control accurately the total air at all times.

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Old and decrepit apartments snuggle behind a prettier Paris.

But better living quarters are

Subsidized Building Eases France's

France, after a 15-year struggle with its housing shortage, is finally attaining its long sought construction goal.

More than 300,000 dwelling units were completed last year and another 300,000 are slated for construction this year, including 90,000 in the teeming Paris area. That's the construction rate housing experts have been demanding for years.

Foreign companies are expected to play a sizable role this year in French construction. They are being wooed by government subsidies and financial aid.

The man behind recent progress on France's number one social problem is the dynamic, 40-year-old Minister of Construction, Pierre Sudreau, who was appointed to General Charles de Gaulle's cabinet in 1958 in the face of a French tradition that ministers be chosen only from the legislature. Sudreau had been Housing and Planning Commissioner in Paris.

Last year, under his jurisdiction, the French government paid more than half the country's total $2.1-billion housing bill—out of state coffers. The government financed construction of some 75,000 to 90,000 units last year at a cost of $460 million dollars. Another $640 million of government housing spending was handed out in the form of subsidies and low interest loans—mostly to construction companies.

Now that the 300,000-unit annual construction rate has been met, Minister Sudreau is setting new building goals. These are his aims as explained to ENR:

- **Attract more foreign construction companies.** More privately-financed

Minister of Construction Pierre Sudreau . . .

plays big role in getting new apartments for workers . . .

going up, with a strong boost from the government.

Housing Shortage

housing is badly needed to ease the government's heavy load (housing takes 10% of the total government budget.) Foreign builders therefore will enjoy the same government subsidies as French firms. Several Italian companies are building in France, and Belgian and German firms are also considering French ventures. Sudreau says American builders would be welcome; "I'll give them the same terms as French contractors," he says.

- **Establish a faster construction rate, up to 350,000 dwelling units annually.** To push up the rate this year, the government is guaranteeing housing builders against future rent freezes. It thus hopes to encourage construction of higher-rent dwellings than the government sponsored structures. Another housing stimulus is an 18 months savings plan under which the government will match savings of potential home buyers with a loan of the same amount to be used as downpayment on a new dwelling.

- **Improve building standards.** Better building with no increase in cost is now feasible. "Our major housing problem after the war was to create a building industry capable of large-scale production," says Sudreau. "This is now accomplished. There are 10 prefabrication processes competing within France."

- **Provide more housing for low-income groups.** Many dwellings built for moderate rate rental with government credits have gone to middle income Frenchmen. "Government funds must be used primarily to help the others," insists Sudreau.

- **Insure better architecture and city planning.** Recently the Minister ordered goverment officials to warn architects and construction men that government funds will go on priority to projects that come up to traditional French esthetic standards.

Despite the progress, France's housing problem is a long way from solution. Between the two world wars, French rents were frozen at their 1914 level. The freeze protected tenants, but made new construction for all but luxury dwellings entirely unprofitable.

Rents have been increased gradually since 1948, but they are still too low to make most private rental building worthwhile for investors unless subsidized by the government. (Rent on a four-room apartment with bath in a middle-class old Paris house is less than $25 monthly.) Present subsidies are enabling private builders to offer low-cost housing units for sales on credit at prices to match the middle-class Frenchman's pocketbook. (The middle-

residences for university students . . .

and small home developments with French flavor.

Alundum NON-SLIP terrazzo combines
DISTINCTION IN DESIGN
with time-proven walking safety

New York's Solomon R. Guggenheim Museum, one of the last and probably most discussed creation of the great Frank Lloyd Wright, is a rare combination of the aesthetic and the practical in ultramodern architectural treatment.

From the practical standpoint, for example, *walking safety* has been provided for its thousands upon thousands of visitors. All of its terrazzo, including the attractive main floor and the viewing ramp which spirals gracefully upward for six floors, has been made effectively *non-slip* with Norton ALUNDUM Aggregate.

For floors, ramps and stairways in all types of buildings, both public and commercial, Norton ALUNDUM Aggregate in the proper proportion, furnishes a terrazzo surface which is non-slip wet or dry, retains its initial beauty indefinitely and is exceptionally resistant to wear.

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Terrazzo: V. Foscato Co., Long Island City, N. Y.

NORTON COMPANY
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NORTON
NON-SLIP FLOORS

Photos by George Cserna

class Frenchman's pocketbook contains about $60.00 weekly income.)

Paris is a special challenge for housing planners. In the capital city and surrounding region, almost one-fifth of France's population is crammed into less than 3% of the country's total area. Twelve percent of the region's dwellings are more than a century old. Almost one-fifth of all Paris housing has no water; one-fourth is overcrowded; and one-half has no private toilets. To make matters worse more than 200,000 people from other areas flock to the Paris region each year.

The government has a four-point program for Paris that would:

- Decentralize industry, moving nonessential plants to the provinces, expecially to the economically underdeveloped areas that are becoming depopulated.
- Move essential industry from the heart of the city out to the peripheral areas.
- Develop Paris suburbs by building houses, parks, schools, and hospitals close to industrial zones.
- Clear slums and renovate existing Paris housing.

No new industries are permitted within the Paris area and requests for permits to build offices in town will get a cold reception.

There are now 14 million dwelling units in France, of which 120,000 units must be replaced annually. The population is growing at the rate of 300,000 a year. Figuring three persons to a dwelling, this means 100,000 new units annually. City-planning operations call for another 80,000 units a year.

These needs add up to the 300,000-units annual goal set by government planners.

Italians Build Arch Dam For Swiss Hydro Plants

Italian engineers and workers are building an arch dam for Swiss owners at the Italian-Swiss border near the Spluga Pass.

The dam will be 2,132 ft long at the crest. Maximum height will be 459 ft, thickness 92 ft at the base and 49 ft at the crest. The reservoir contained by the dam will hold 157,600 acre-ft of water.

The artificial lake will feed Swiss hydroelectric power plants.

The small rectangle of Italian territory on which the dam and reservoir are being built will pass under Swiss sovereignty. To compensate Italy, the Swiss-Italian border will be modified in Italy's favor at some other point.

FORTY DAYS FROM FOUNDATION TO "OPEN HOUSE" with pre-engineered STRAN-STEEL buildings

Versatile, attractive Stran-Style buildings with their horizon-hugging styling and distinctive Stran-Satin colors complement any community, go up fast, and cost less than you'd expect to pay for such quality. Smart, exclusive Stran-Satin colors are unusual, because these multi-layer protective coatings of vinyl-aluminum or vinyl-base color are factory-applied over zinc-coated steel. Stran-Satin colors won't chip, peel, crack or fade . . . give long-lasting beauty without maintenance. You have a choice of nine attractive hues. All blend well with wood, brick, glass or stone. Financing available for complete buildings from ground up. For complete information, fill in and mail the coupon below or call the Stran-Steel dealer near you. He's listed in the Yellow Pages.

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Built by
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the most popular performer on the road

There's a big difference between run-of-the-mill acting and *star performance.* And that's why the Cedarapids Bituminous Paver is the most popular performer on the road! Owners say so . . . they're the ones who like the Paver's profit-making role. Job superintendents say so . . . they're the ones responsible for the results of Paver performance. Operators say so . . . and they're the ones with first hand information about the performance of the machines they run.

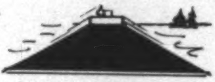
Join the ranks of the hundreds of paving contractors whose enthusiasm for the on-the-job performance of Cedarapids Pavers makes them the most popular stars on the road today.

JEANNE CRAIN IS SITTING PRETTY
on this Cedarapids Bituminous Paver while she describes the all-automatic controls to Miss State University of Iowa. The popular TV and movie star knows more about acting than she does about machinery, but she certainly knows about popularity. When a machine becomes as popular as this Cedarapids Paver, you can be sure its performance is "way above average."

Industrial Asphalt
Cedarapid
Industrial Asphalt

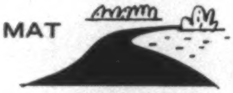
why is the cedarapids paver so popular?

IT'S FAST



Operating speeds up to 102 feet per minute get the job done quicker and at less cost. You can handle more jobs per season.

IT LAYS PERFECT MAT



The vibrating screed "irons" the mix into a smooth, uniform, high density mat with no voids or tears, even at 102 fpm. The Cedarapids Paver saves time and money . . . there's little need to go over rough spots. Takes less rolling, too.

MAINTENANCE IS EXTREMELY LOW

⅓ fewer wearing parts than on other pavers cut maintenance requirements and costs. Less downtime means more *work* time per season. You can bid confidently on the tightest paving schedules.

IT'S EASY TO OPERATE

"It's an operator's paradise," say the men in the driver's seat. The few simple electric controls make the Cedarapids Bituminous Paver so automatic it almost operates itself.

California Contractor

"Fastest Paver alive! Its precision performance is far beyond our expectations."

Texas Contractor

"It's the best machine I've ever used."

"We like the speed and mat-laying qualities of the Paver, and also the design of our Cedarapids Bituminous Mixing Plant."

Canadian Contractor

COMPLETE YOUR PAVING PICTURE WITH A CEDARAPIDS MIXING PLANT

Here's the way to supply your Paver with lowest cost mix. Use the Cedarapids Bituminous Mixing Plant model best suited to your production needs. The complete line includes portable or stack-up batch-type models with all-automatic, semi-automatic and manual controls, in 1500 lb. to 7500 lb. batch sizes. Two sizes of continuous mix plants also available.

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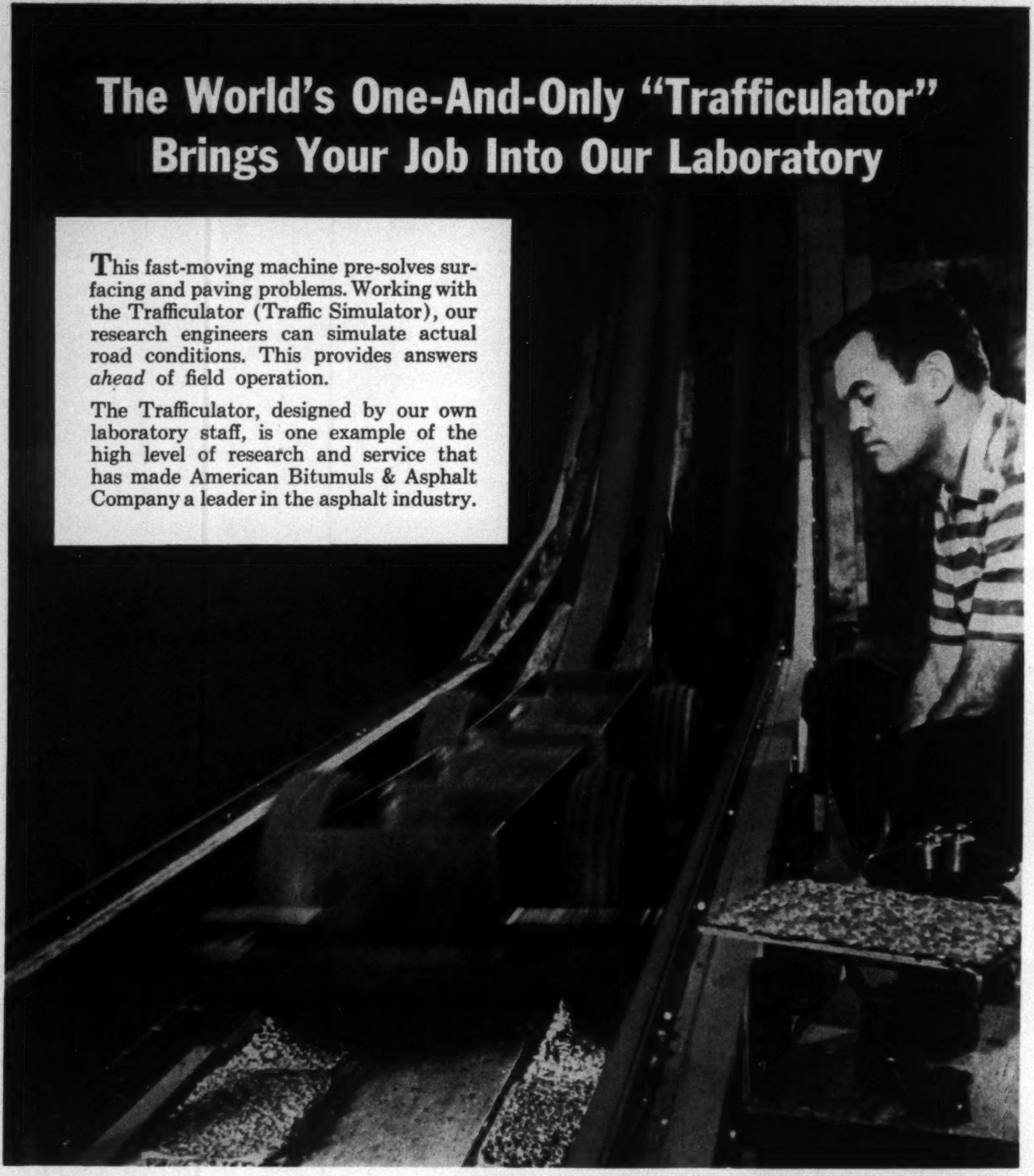
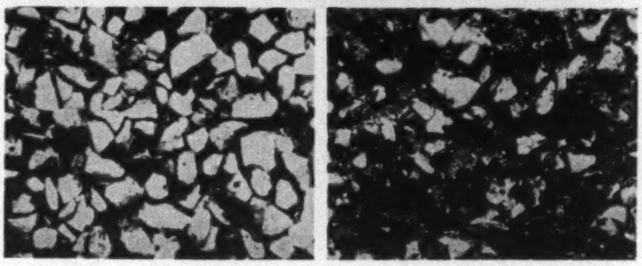
The World's One-And-Only "Trafficulator" Brings Your Job Into Our Laboratory



This fast-moving machine pre-solves surfacing and paving problems. Working with the Trafficulator (Traffic Simulator), our research engineers can simulate actual road conditions. This provides answers *ahead* of field operation.

The Trafficulator, designed by our own laboratory staff, is one example of the high level of research and service that has made American Bitumuls & Asphalt Company a leader in the asphalt industry.

Trafficulator Tests Prove Cationic Bitumuls Reduces Loss of Siliceous Cover Stone



After 1,000 passes by the Trafficulator, cover stone retention on the Cationic panel (left) is 70% better (by weight) than on the panel prepared with regular grade emulsion.

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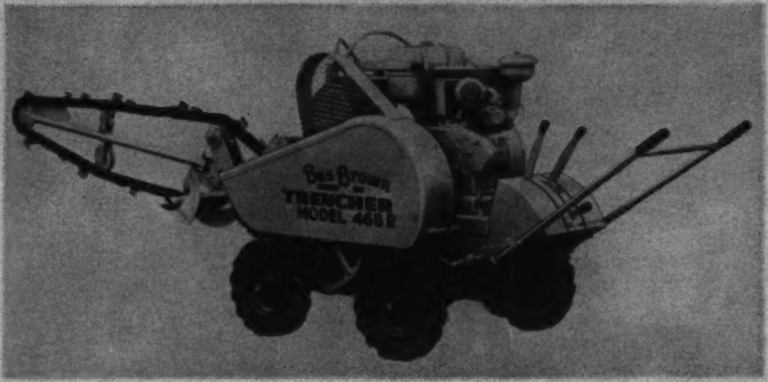


Trencher Digs Wider Ditches

A new model trencher is 350 lb heavier and digs wider trenches than its predecessor. It has variable trenching speeds up to 12 fpm and will dig ditches up to 12 in. wide.

The four-wheel drive of the old model is retained in the new for digging. The drive is two wheel in transport gear. For easy steering while moving forward and loading, the trencher features balancing on the two front wheels.

The machine is designed to dig trenches for utility lines, lawn irrigation, and the like and to lay out limits for excavation, says the manufacturer.

Powered by a 12-hp Wisconsin engine, the Model 468R trencher is equipped with a hydraulically controlled digging boom that can be raised to an upright position.

Other specifications include the frame of welded ¼-in. steel plate; 4x8 pneumatic traction-type tires; digging chain with easily detachable cutters; and permanently sealed roller bearings. Shipping weight is 1,100 lb. THE BROWN MANUFACTURING CO., INC., WOODBINE, IOWA.

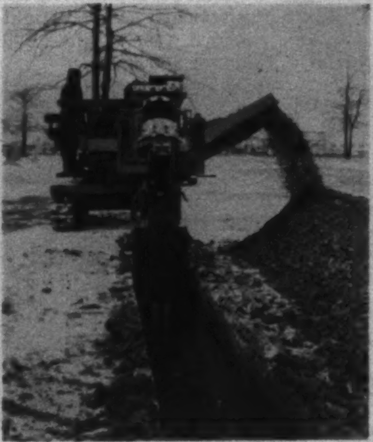
Trencher Wheel Shifts Laterally

The JS-30 trencher features instant lateral positioning and tilting of the digging wheel. The unit digs trench behind either crawler or at any point within its 6-ft width. It also cuts vertical trench on side slopes and other locations where one crawler track is on a higher level than the other.

The machine can dig the edge of a 24-in.-wide trench 5 in. outside either track, permitting trench to be dug flush with parallel pavement, curbs and sidewalks. It can excavate short runs of extra-wide trench, bellholes, etc., up to a 6-ft maximum width without laterial repositioning of its crawler. Hydraulic power-tilting of the digging wheel 7 degrees to either side of vertical is provided.

The JS-30's standard trench capacity is from 11 to 24 in. wide, down to 5½ ft deep.

The unit has a V-shaped conveyor, which is driven, shifted and reversed by dual independent hydraulic drives contained within the conveyor. Automatic conveyor positioning permits the operator to place spoil where required. All operation are lever-controlled.



A 370-cu in. diesel engine developing 56 hp at 1250 rpm, drives through main transmission to the digging wheel differential. Operator has choice of four wheel speeds and 12 individual crawler speeds. CLEVELAND TRENCHER COMPANY, 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO.

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IGLOO, world's No. 1 Water Cooler, is available in 2, 3, 5, 10 and 15 gallon sizes—23 models in all.

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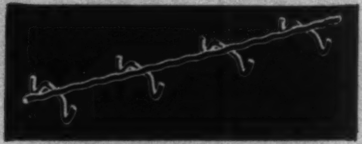

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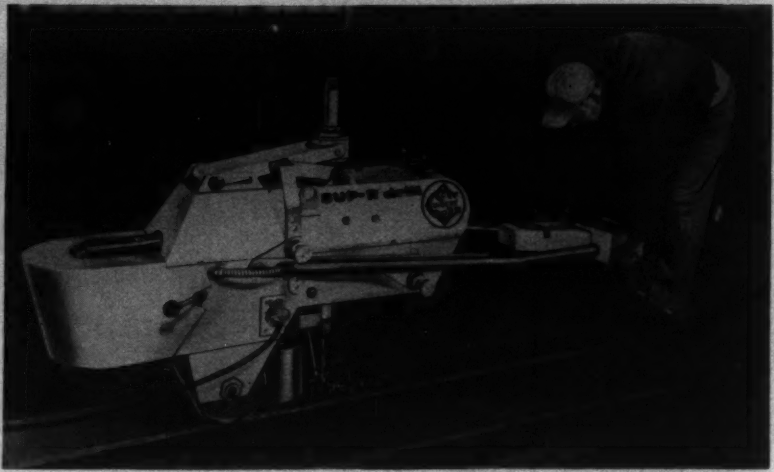

Magnet Positions Portable Drill

The Magnetic SUP-R Drill, held firmly in position by a one-ton magnet, reams, drills, or countersinks holes in steel up to 1½ in. dia. The 730-lb drill is powered by a 5-hp electric motor with four-speed gear shift.

Other features include a "Quick-Lock" chuck for fast bit changes, stainless steel body, and aluminum castings used wherever possible to reduce weight. Guibert Steel Co., Pittsburgh 4, Pa.

Increased Capacity for Pipelayer

The No. 561 Series B integrally designed pipelayer is capable of 12,270-lb greater lifting capacity than its predecessor, the MD6 Pipelayer.

Maximum lift capacity of the No. 561 is 38,800 lb at 4-ft overhang with 5,000 lb adjustable counterweights. Two other stationary counterweight groups are available. One weighs 2,500 lb and the other 3,500 lb.

The machine is powered by a newly designed engine that delivers 93 flywheel hp. Manual off-track starting with a vertical gasoline starting engine is standard. In-seat starting of the gasoline engine with a 12-volt electric system is optional. A 24-volt direct electric starting system is also available for the diesel engine.

Operational safety features are provided. Boom and load line brake levers are positioned close to the operator's right-hand arm rest. A special safety feature is the spring loaded boom brake lever, which returns automatically to "brake-on" position when released. Additional safety is provided by an interlock lever that, when engaged, locks the boom drum and holds the boom winch transmission out of lowering gear.

The No. 561 has 74-in. gauge and 18-in. grouser shoes. There is a total of 3,130 sq in. of ground contact with an approximate operating weight of 25,300 lb. Minimum ground clearance is 10.5 in. Standard boom length is 15 ft, with optional booms of 12.5 and 18 ft now available.

Boom and load lines have three lift speeds and one for lowering. Lift speeds are 102 fpm in first gear, 177 fpm in second gear, and 723 fpm in third gear. Lowering speed is 102 fpm.

Lifting capacities vary from 6,200 lb at 12-ft overhang without counterweight to 38,000 lb at 4-ft overhang with 5,000-lb counterweight. Caterpillar Tractor Co., Peoria, Ill.

Flush Lights Mark Airport Runways

High intensity marker lights for airport runways extend only 1 in. above the ground. They are available in three styles.

Type FMU gives a single light beam from the approach direction only. Type FMB provides two beams, and is for use on runway edges or wide intersections. Third type—FMT—provides blue light in all directions and is used along centerline or sides of a taxiway.

Lights are designed so planes may land on or pass over them without damage. Snow removal equipment also can pass over them without damage to the lights, according to the maker. Crouse-Hinds Co., Syracuse, N. Y.

IF EVER A BOLT CAME UP WITH THE ANSWERS— IT'S THIS ONE!

The Lamson High Strength Bearing Bolt* is solving some of the oldest, meanest and costliest problems ever presented by steel connections.

Recent highly successful applications include: steel mill buildings and cranes, railroad bridges, dragline buckets, construction machinery, radar antennas.

THE BASIC ADVANTAGES ARE BIG ONES:

1. **High Strength Bearing Bolts combine the tensile strength of High Strength Bolts with the bearing properties of rivets.**
2. **High Strength Bearing Bolts have the highest shear strength and greatest resistance to slip of all structural fasteners.**
3. **High Strength Bearing Bolts make possible important labor savings in fabrication and erection.**
4. **The High Strength Bearing Bolt assembly (bolt, nut, one washer) costs no more, grip for grip, than a High Strength Bolt assembly (bolt, nut, two washers).**
5. **High Strength Bearing Bolts (and Lamson High Strength Bolts) are available from every Steel Service Center of U.S.S. Supply Division, United States Steel Corporation.**
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*Pat. Applied for

For easy driving, the knurls are ball-shaped in front, relieved in back, set in a spiral pattern. In most grips, bolt can be placed in hole, then pulled through connection with torques well below final assembly torque. One man can install—no need to hold the head.

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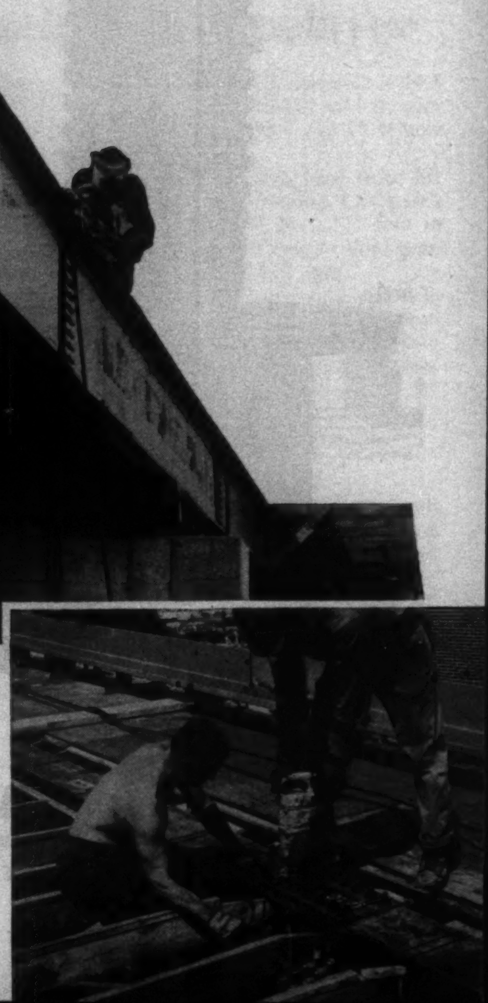

TRIM THREE MONTHS OFF OVERPASS JOB TIME. Project: 850-Ft. continuous span overpass, West 140th St., Cleveland, Ohio. Job completed, bridge in service in just nine months, three months ahead of schedule. According to the contractor, Hunkin-Conkey Construction Co., Cleveland, *Republic High Strength Bolts* helped speed erection, keep costs down.

Girders were assembled on the ground to form 120-Ft. spans, then hoisted into position. Results: greater safety, big time savings, fitting-up bolts eliminated. The contractor estimates that erection costs were about 50% less than riveting. Crew size is cut in half. Get the complete story on the advantages of Republic High Strength Bolts by sending coupon.

UP THEY GO, with amazing speed. *Truscon Insulated Sidewall Panels*—the fast, low-cost way to construct modern equipment shelter, field offices, service buildings, etc. Panels are built by sandwiching a layer of insulating material between two sheets of Truscon 24" Ferrobord® or Galvanized Ribbed Sheeting. Securely interlocked for weather-tightness. Mail coupon for more data.

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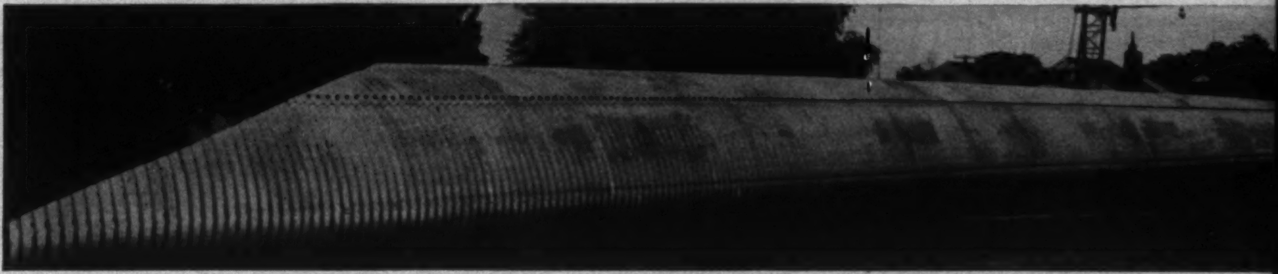
ASSEMBLED IN FOUR DAYS. 146-Ft. *Republic Sectional Plate Pipe-Arch* assembled by a six-man crew in just four days. Installed in 2½ hours. Result: exceptional savings in time and money, earlier project completion, minimum construction traffic tie-ups.

Fast-assembly features include: simplified design—no need for highly skilled labor; sections of optimum size for easy handling, specially designed bolt that permits all tightening from one side only. Mail coupon for more information.



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Maj. Gen. Augustus M. Minton, new president of SAME, is the . . .

Builder for the Air Force

The new president of the Society of American Military Engineers has an ideal background for this interservice organization. Maj. Gen. Augustus M. Minton, the Air Force's Director of Civil Engineering, began his military in the Army's Corps of Engineers. Now he works with both the Army Engineers and the Navy's Bureau of Yards and Docks on the construction of Air Force installations.

General Minton's job takes him not only beyond service boundaries, but over international boundaries. He's in charge of maintenance and operations at an Air Force installation of one kind or another, from a simple weather station to a complex ballistic missile base, in just about every country in the free world.

The Air Force inventory of real property is valued at about $11 billion, greater than the combined inventory of American Telephone & Telegraph, General Motors, Ford, Chrysler, General Electric and Union Carbide & Carbon Corp., six largest corporations in U. S.

Almost $750 million is spent each year on Air Force construction. Members of the Directorate of Civil Engineering also "monitor" an annual expenditure of another $750 million for maintenance and operation of facilities.

More than 100,000 persons work in Air Force Civil Engineering, 2,000 officers, 39,000 airmen and 59,000 civilians. Their job is to program military construction, establish design specifications and criteria, design facilities, monitor construction, maintain and operate facilities, and acquire and dispose of real estate.

"One of our biggest jobs is maintenance," says General Minton, a businesslike man who has more the demeanor of a partner in a successful consulting firm than of a wild-blue-yonder general. "We've got this facility spread over the free world. It includes everything from gravel roads to intricate radar bases. Some of the stations are in remote spots that offer difficult logistics problems. Spare parts can't always be turned up over night.

"Most of our installations were built during the past eight years. Now they're beginning to show wear. Maintenance calls for a real effort on the part of first-class engineers. We've got 100,000 people authorized and we can do the job if they are properly trained, guided and motivated."

Since he took command of the Air Force civil engineers in 1957, General Minton has been pushing a program designed to upgrade Air Force engineering, a plan that embraces training, guidance and motivation. He is working to have every engineer in his command licensed as a professional engineer.

"I've been emphasizing registration for military and civilian engineers in the Air Force, because I think it is the most important thing they can do to enhance the prestige of their profession, their service and themselves," says General Minton.

"Registration implies prestige, stature, self respect and the other elements of a true profession. I believe there is one other important element, motivation.

"Why is enrollment in engineering schools increasing in Russia and decreasing here? It's because engineers are persons of stature there. You know the positions we (engineers) hold in the eyes of the community. Conversely, you know of the great strides made in engineering education in Russia. It is in terms of dedication and motivation that they are surpassing us."

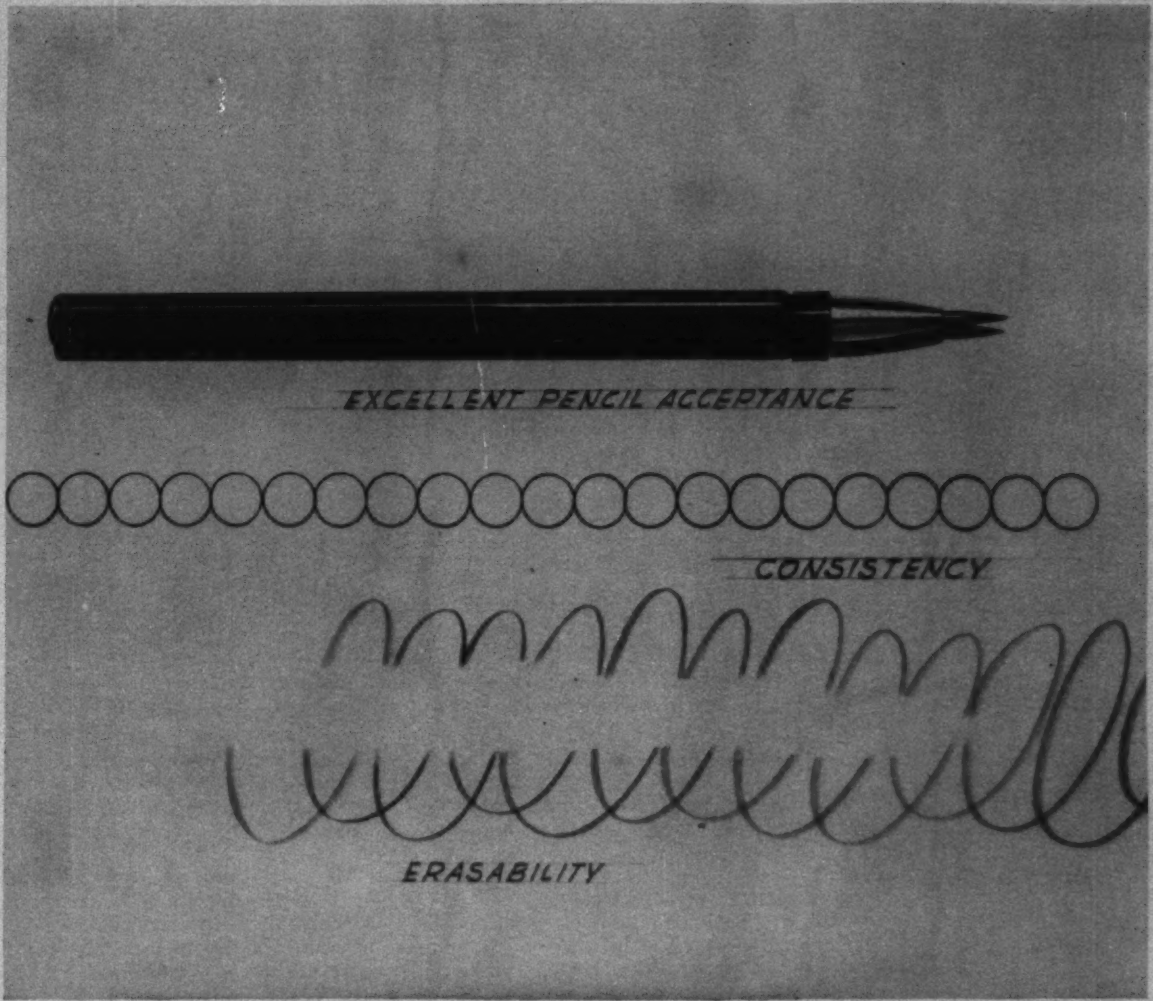
"Perhaps it's in terms of dedication and motivation that we, as engineers, are really lacking. Students reflect the motivations and enthusiasms of their professors and young engineers reflect those of the persons they work for. The Russians are using this to build a solid engineering capability. Unless we match them, we'll be in real trouble in five or ten years. It will be a scientific world in 1970."

Two years ago the Air Force's Directorate of Civil Engineering had a 100% increase in its number of registered engineers and last year the rise was 50%.

General Minton won registration as a civil engineer and as a mechanical engineer in the District of Columbia only recently. "It took quite a bit of work," he says, "I put it off much too long."

He studied engineering at the University of Illinois. When he graduated in 1933, he was commissioned a reserve lieutenant in the Corps of Engineers. That commission was a bit of misdirection that took eight years to adjust.

"When I was at the University of



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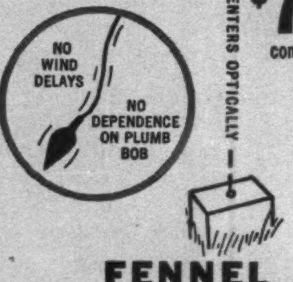

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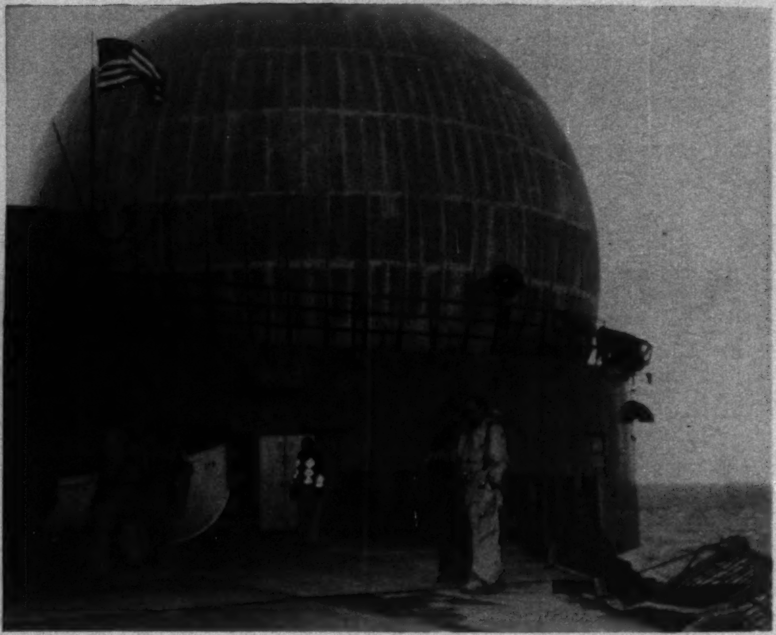

TEXAS TOWER RADAR STATION, a solitary sentinel in the Atlantic, is one of the many isolated Air Force installations General Minton and his civil engineers look after.

Illinois I wanted to get in the Air Corps, wanted nothing more than to be a flier," he says, grinning at his early naivete. "'I went in one noon to register for the military and there was no one around but a fat master sergeant—I still remember his name.

"I told him I wanted to get into the Air Corps and be a pilot. He said I was just the man he was looking for, that he would take good care of me. He had me sign this form and that form and I went away. A few days later I found I was in the Engineers."

He entered active service in 1935, planning to make the Army a career. In 1941 he switched to the Air Corps. During World War II he served at a number of bases and headquarters in the Air Training Command doing personnel work and administration. He was made commander of Chanute Air Force Base, Ill., in 1954. He is one of two non-rated (not a pilot) Air Force generals ever to command a base. He tried repeatedly to get into pilot training, but his eyesight wasn't up to Air Force physical standards. He was successful, however, in applying for a year of training at Harvard University in 1947-1948 and graduated with a M.S. degree from the Graduate School of Business.

In 1957 he became the seventh director of Air Force Civil Engineering since 1947, when the Air Force became a separate military unit. One of his moves in establishing identity of his engineers was to change the Air Force term for officers charged with construction and maintenance from "installation officers" to "civil engineering officers."

They are not all civil; perhaps the civils are outnumbered by the other branches. But there's significance in the choice of civil engineering to describe the general function of these Air Force officers.

Since the Air Force was separated from the Army 13 years ago, the Corps of Engineers or the Navy's Bureau of Yards and Docks have acted as contracting agencies for major Air Force construction. Air Force Regional Civil Engineers, counterparts of the Army's District Engineers, monitor the work and are responsible for general policy guidance on all the phases of engineering work.

No matter who handles the work, the Air Force will continue to have a lot of it. The base-building program for intercontinental ballistic missiles is picking up speed and will grow rapidly until some other weapon is developed as the answer to the nation's defense needs. The advent of the ICBM also means that few, if any more, conventional bases will be built. Those in existence can handle whatever aircraft are likely to be developed. Because the Atlas, Titan and Minuteman can reach almost half-way around the world, there will be fewer contracts for overseas bases.

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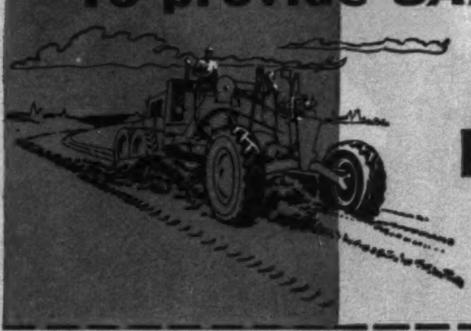
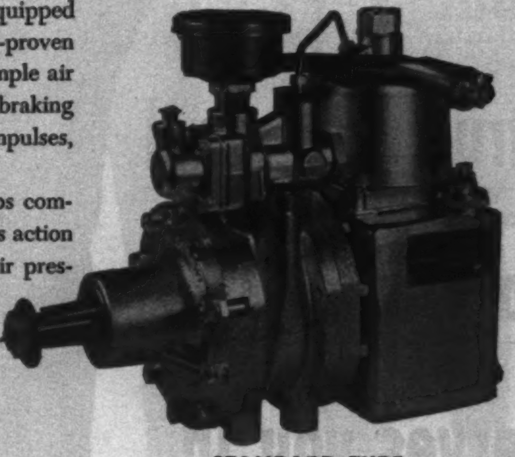


Wagner Lockheed ROTARY AIR COMPRESSORS

deliver ample air for safe operation of brakes

You'll have plenty of air for safe, sure stops when vehicles are equipped with Wagner Lockheed Rotary Air Compressors. The time-proven rotary action contributes to rapid pressure recovery, assuring ample air reserve. This means safer stopping power even under severe braking conditions. Rotary action, with its overlapping air compression impulses, also contributes to smoother, quieter operation of unit.

Pumping is regulated by a control valve which starts or stops compression by "loading" or "unloading" the compressor proper. This action establishes an intermittent pumping cycle which keeps reservoir pressure within the desired range.



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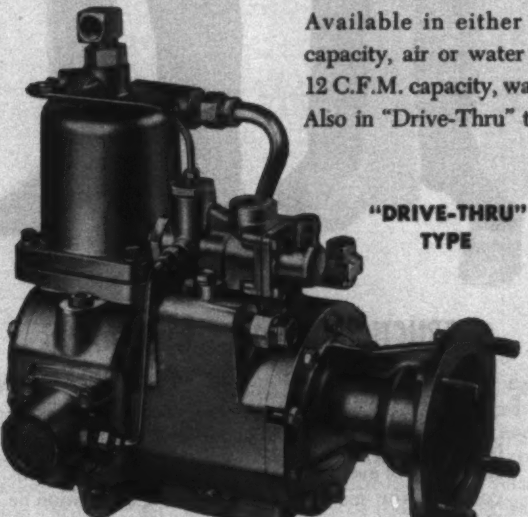

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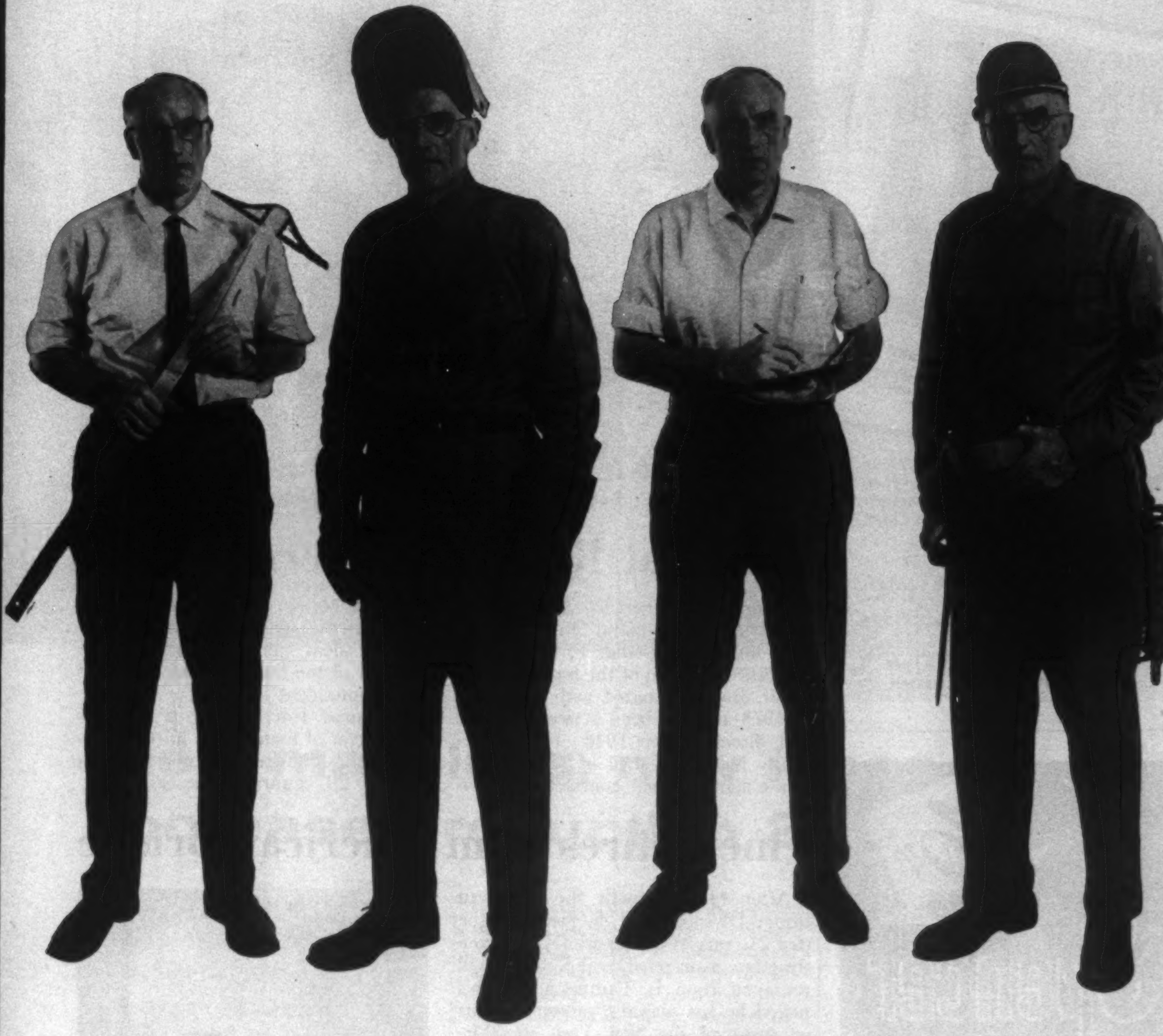

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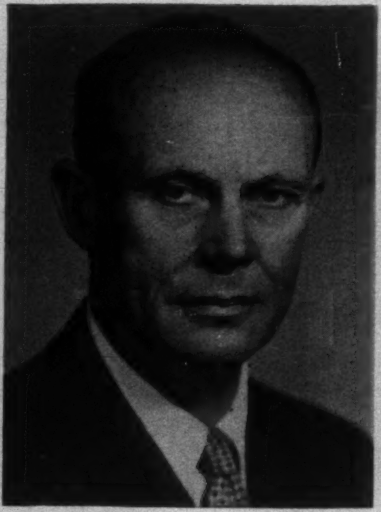


Henry C. Boschen

George F. Ferris

Chiefs at Raymond International

Henry C. Boschen has been elected president of Raymond International, Inc., succeeding George F. Ferris, who moves to chairman of the board.

Mr. Boschen started with Raymond in 1928 and has been a vice president and director since 1946. He has recently been in charge of the corporation's many general contracting activities under way in the U. S. and abroad.

Mr. Ferris joined the company as vice president, general manager and a member of the board in 1946. He was elected president in 1953.

Raymond International is a major constructor of foundations in this country and has construction projects going in over 20 countries overseas.

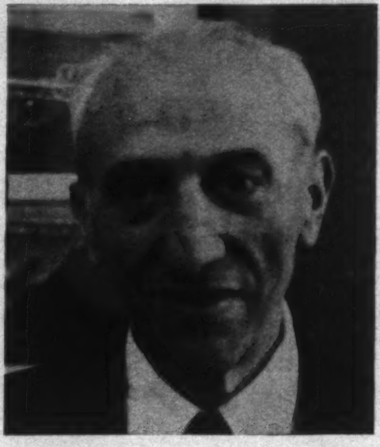
Fine Retires from American Bridge

After 44 years with the American Bridge Division of U. S. Steel—for the past 25 years its New York District construction manager—David S. Fine will retire on June 1. During all of this period he has played a prominent part on many of the New York area's famous bridges and buildings.

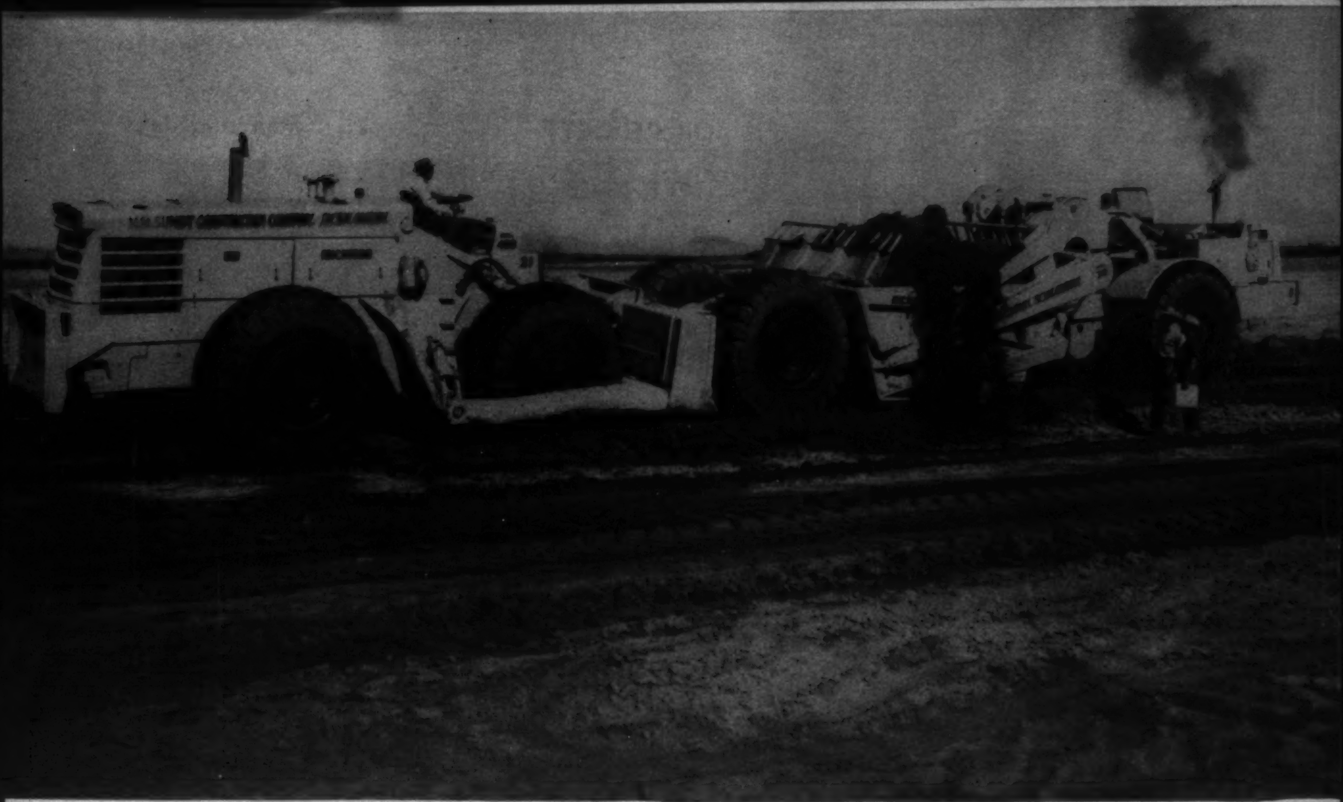
In the late 20's Mr. Fine was resident engineer on the Kill van Kull steel arch, longest in the world, and on the Jersey City section of the Pulaski Skyway. Later, as district manager, he supervised the erection of such notable steel bridges as the Henry Hudson hingeless arch, the Marine Parkway lift bridge, the Bronx Whitestone suspension bridge, and the Tappan Zee bridge on the New York Thruway, as well as the spinning of the cables for the Triborough Bridge.

In the building field, he supervised the erection of the Trylon and Perisphere at the 1939 New York World's Fair, the United Nations Building, the Socony Mobile Building and the an- the erection of the Trylon and Peritenna atop the Empire State Building.

Current jobs that he has started include the cables and floor system for the Throggs Neck Bridge, a new Delaware River crossing at Delair, Pa., the Union Carbide Building, the First National City Building and the Equitable Life Building.



Mr. Fine went to work for American Bridge immediately after graduating in civil engineering from the University of Pennsylvania in 1916.



600 hp Michigan Dozer heaps 29 yd Michigan Scraper in 35 seconds,

New machines, new ideas increase production 20%

5 Michigan Tractor Scrapers and a 600 hp Michigan Tractor Dozer, on Southwest Interstate job, move 8,750 tons daily

Some new equipment and some unusual techniques are helping M. M. Sundt Construction Co., Tucson, Arizona, get an important 20% increase in production:

The new equipment includes *five* 375 hp, 29 yd Michigan Tractor Scrapers and a big *600 hp*, 104,000 lb, Model 480 Michigan Tractor Dozer. The Scrapers are being push-loaded by the Dozer with an average of *35 tons in 35 seconds*... this weight is extremely accurate since *each load is being weighed*, according to Arizona state regulations, by a state representative on a truck-type platform scale.

Borrow sprinkled 7 days

The unusual techniques were developed to speed dirtmoving and to more easily meet strict compaction specs. For example, before digging starts, the dry, sun-baked borrow area is laced with perforated pipe. Water sprinkles out night and day for about a week. Once the soil is saturated seven to nine feet deep, Sundt turns off the water, removes the pipe, brings in his earthmoving machines. Pre-wetting, say men on the job—a 5.3 mile, $1,031,000 section of Tucson-Benson Interstate Highway—makes for easier loading. It also has eliminated the clutter of water wagons and motor graders and extra sheepsfoot rollers which previously kept scrapers waiting in line to unload.

Load at 7½ mph

With the Michigan Scrapers, loading of the damp 2800 lb/yd silty caliche mixture is done in second gear (7½ mph). Scrapers power-shift instantly to third (15 mph) as they're shoved off . . . move to and from the fill at speeds up to 30 mph. The result is 50 two-mile cycles *per Scraper* per 8-hour shift . . . 8,750 tons total . . . 20% more pay-dirt than previously moved by same size fleet of another make.

"The Monster"

The Michigan Model 480 Tractor Dozer is proving a remarkable pusher. The men have dubbed it The Monster. "It sure has power!" says Clay Smith, operator. "It loads these big Scrapers fast (usually in second gear 7½ mph) . . . backs up fast . . . goes from one borrow area to another fast (15 to 28 mph)."

Built-in scarifier

Where borrow is tight and tough, an optional Model 480 attachment, blade-mounted scarifier teeth boost production. When dozing or pushing forward, these teeth fold up, out of the way. But on return operator drops blade, teeth jut out and rip 8 inches deep . . . just right for the next scraper pass.

Michigan units like these are helping dirtmovers all over the country boost production. Three Scraper models—10½, 19, 29 yds—four Dozers—162, 262, 375, 600 hp—are now available. Your Michigan Distributor will be glad to show them to you.

Michigan is a registered trademark of

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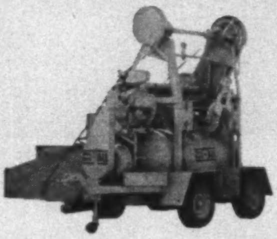
"We place 8 cubic yards of 6-sack concrete (5,500 p.s.i., up to ¾" aggregate) per hour with the new True Gun-All."

*These are actual production figures from the construction of St. John's Abbey, Collegeville, Minn. With a True Gun-All wet-mix pneumatic concrete machine you shoot real concrete, not a sand and cement mortar, and you eliminate costly double-forming, even on vertical surfaces. For details, write for free catalog.



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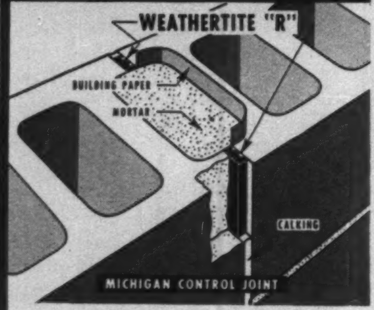

To safeguard against cracks in block-constructed masonry walls, always use an approved Control Joint. To prevent water seepage through these control joints, always use WEATHERTITE seals. Two types are available: WEATHERTITE "R" for Michigan Control Joints; WEATHERTITE "RB" for Besser Control Joints. WEATHERTITE is a specially shaped strip of expanded Polyvinyl-Chloride which provides a permanent and effective watertight seal in standard control joints. See Sweet's Architectural File, or write for information on WEATHERTITE; EVERLASTIC GASKETS for stone coping, sills, masonry wall panels, etc.; and WATERSTOPS for sealing construction joints between cast-in-place concrete members.

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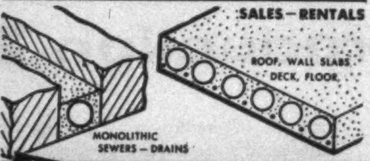

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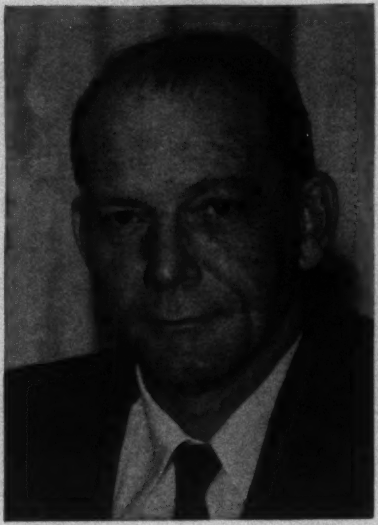

A. K. Allen Gets Post At Blount Brothers

Blount Brothers Construction Co., Atlanta, Ga., has announced the appointment of Alfred K. Allen as vice president and manager of the heavy construction division.

Prior to joining Blount, Mr. Allen served as vice president and manager of all domestic heavy construction for Utah Construction Co., San Francisco, Calif.

A native of Birmingham and a graduate civil engineer from Auburn University, Mr. Allen gained wide experience in construction during World War II. He served two and one-half years in India, Burma and China on airfields and the famed Ledo Road. He was also construction quartermaster and area engineer on the $19-million general office area and warehouse of the Atlanta General Depot.

His later experience includes commercial and industrial plants, housing projects, steam plants, warehouses, office buildings and bridges.

Careers

George E. Holbrook, a vice president, director and executive committee member of E. I. du Pont de Nemours & Co., has been elected vice president of Engineers Joint Council. Mr. Holbrook succeeds **Cecil Boling,** who has resigned for personal reasons.

Ivar Paulsen has become an associate in the New York office of John Graham and Co., Architects & Engineers.

Albert F. Dagit, Philadelphia architect, has formed his own firm, Dagit Associates. His two sons, **Albert, Jr.** and **Daniel** will be active in the organization.

Strips 2500 yds of asphalt in 8 hours

262 hp Michigan Tractor Shovel helps V. Ottilio cut costs 50%

All over the country, enterprising contractors are finding Michigan Tractor Shovels can effectively handle jobs once considered much too tough for rubber-tired equipment.

Here's a case in point.

V. Ottilio & Sons, Paterson, New Jersey, widening and resurfacing a 2½ mile stretch of U.S. Route 46 near Paterson, used one of their five Michigans, a 262 hp Model 275A, with 22,000 lb lift capacity and 4½ yd bucket, to rip up and load old pavement . . . plus handle excavation for the new roadbed.

Pavement handled, mostly asphalt shoulder cover, averaged 4 to 6 inches thick—up to 9 inches in some places—weighed about 3200 lbs per cubic yard. Ottilio found the big Michigan, working alone, *handled the job 50% cheaper* than could a combination of machines.

Michigan replaces swing shovel, crawlers

Before the Michigan started work, Ottilio tried a 1¾ yd swing shovel and a pair of crawler pushers. Production was good, but not good enough. So, for more loading capacity, in came the Michigan. It worked so well, the other rigs were taken off the job. Then, contractors thought they'd speed things still further by adding a 45,000-lb-class crawler. This move proved unnecessary! The increase was so small the crawler was retired *and the Michigan did the entire job!*

Versatile unit handles topsoil, old pavement, rough-grading

First, the 28 mph Tractor Shovel placed barricades and flashing-light stanchions. Then it stripped and truck-loaded top soil. Next, it broke out and loaded 4 lanes of old pavement. Next came excavation and loading out of all dirt in the center island. Last, the Michigan rough-graded sub-base for the new 6-lane highway to 12 inches below existing grade. Stripping and loading production ran as high as 3,000 bank yards in 8 hours. It averaged 180 truckloads, 2,500 yards a day—compared to 1,500 yards the old way.

Like Ottilio & Sons, *many* Michigan owners are finding this Tractor Shovel will improve production on jobs never before tried on rubber. For proof, ask your Michigan Distributor to demonstrate. You name the job!

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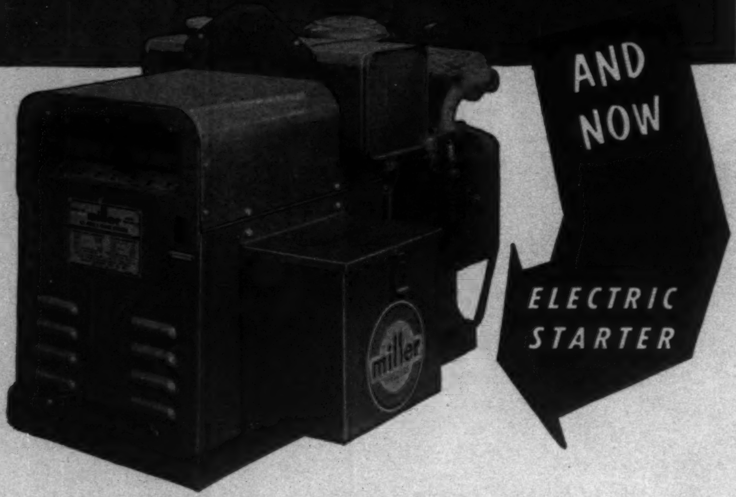

The world-wide respect and demand for this original Miller gas engine driven welder/power plant has never been greater. To this established popularity has now been added the convenience of Bendix drive electric starting as optional equipment on models AEA-200-L and AEA-200. Model illustrated and headlined is AEA-200-LE.

As a welder, as a power plant, as a pipe thawer, indeed, as a top hand from Canadian uranium mines to Brazilian cattle ranches — and on highway construction jobs and repair ships between — the AEA-200-L stands quite alone as "the finest in the field." In addition to optional electric starter, road trailers and rubber tired running gear are also available.

Other Miller gas engine driven DC and AC-DC welder/power plants to 300 amperes at 100% duty cycle. Full particulars will be sent promptly upon request, or a demonstration can be arranged at your convenience.

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Emil F. Vranich announces the formation of a consulting engineering firm, Emil F. Vranich & Associates. They will specialize in building design, foundation engineering, construction supervision and general civil engineering services in Milwaukee and vicinity.

Henry G. Meier has joined Monical & Wolverton, Indianapolis engineers and architects, as head of the architectural department.

Frank B. Sarles announces the inclusion of two of his engineers in his consulting practice in Santa Rosa, Calif. They are **Walter E. Brelje** and **William B. Race,** giving the company name Sarles, Brelje & Race.

Thompson-Starret Construction Co., New York City, has appointed **M. John Mee** as president. Mr. Mee was formerly construction manager of Fred J. Brotherton Co., Hackensack, N. J., and Harrisburg, Pa.

Robert E. Meyer, formerly with Stevens & Thompson, Portland consulting engineers, has opened his own consulting engineering office in Beaverton, Ore., where he will specialize in sanitary and municipal engineering and land development.

A. Bruce Onderdonk and **Robert P. Lathrop** have formed the consulting structural engineering firm, Onderdonk & Lathrop, Glastonbury, Conn.

C. M. Spainhour announces his resignation as president of Airways Engineering Corp., in Washington, D. C., to open his own consulting engineering office there. He will specialize in harbor and airfield improvement.

Thomas S. George, Jr., William B. Miles and **Victor W. Buhr** have formed a partnership for the general practice of architecture and engineering. The firm, named George, Miles & Buhr, will be headquartered in Salisbury, Md.

John F. Wich has been elected president of Lardner & Wich, Inc., Baltimore construction and engineering firm. He replaces **Michael V. Lardner** who remains as chairman of the board.

Gunnar Birkerts and **Frank Straub** have announced their partnership under the name of Birkerts & Straub, Architects, Birmingham, Mich. Both were until recently principals of Minoru Yamasaki & Associates in Detroit.

Richard J. Canavan, director of the construction department of the National Association of Home Builders, has resigned to become a homebuilder. He will join the newly organized firm of Unibuilt Components Co., Omaha, Neb. as general manager of the company.

William A. Robinson has been elected a director of Dravo Corp., to fill the unexpired term of **William K. Fitch,** who has retired.

Speed was the answer to lost time caused by rain. Pushing in both directions at 4 mph...

Michigan Dozer loads 832 yds/hr

The forecast was for rain...and more rain. Same forecast yesterday . . . and the day before . . . and the week before. Already, Anderson Earth Construction Co, Calgary, Alberta, had lost 25 shifts. Even worse, only 40 shifts or so were left before freezeup. The job—500,000 yds of borrow, plus 40,000 yds of common excavation on a 3.14 mile stretch of new Highway #2 south of Calgary—*just had to be completed!*

Fleet includes two Michigan Scrapers

Even under this pressure, William Anderson, owner-manager of the firm, had a team he felt confident of—two 19 yd Michigan Tractor Scrapers, two 18 yd units and a rubber-tired 262 hp Michigan Tractor Dozer. Speed was the factor, felt Mr. Anderson, which could get the job done. "Basically," he says, "our confidence was founded on a loading method made possible by the dozer."

This Michigan, like all Michigans, had the same gears, and speeds, both forward and reverse. Equipped with a pusher-block in the rear, it could push either direction with the full power of its 262 hp engine equipped with torque converter. Thus, by loading scrapers in alternate directions, all turns and all backup time would be saved.

Average load time —35 seconds

And so the final phases of the wet job proceeded. Load times in the water-soaked clay ranged from 25 to 45 seconds. Most pushes were made in second gear, averaging 4 mph. Loads averaged 14 to 15 pay yds. Even in this slippery footing, the Tractor Dozer with 29.5-25 hydroflated tires, four wheel drive, and a working weight of 56,680 lbs, had plenty of traction.

Dozer services 4 scrapers despite hauls under 1000 ft

Michigan serviced four scrapers, one more than usual, even though most hauls were under 1,000 ft one-way. Cross-sections showed it loaded 832 pay yards per hour throughout standard 12-hour shifts. Alternating directions of push had the advantage of cutting waiting time; also the apparent disadvantage of virtually eliminating time for operator to rest. Even so, because of its ease of operation, the Michigan Dozer and its one operator produced as much their 12th hour of work as their first—an average of 10,000 pay yds per day.

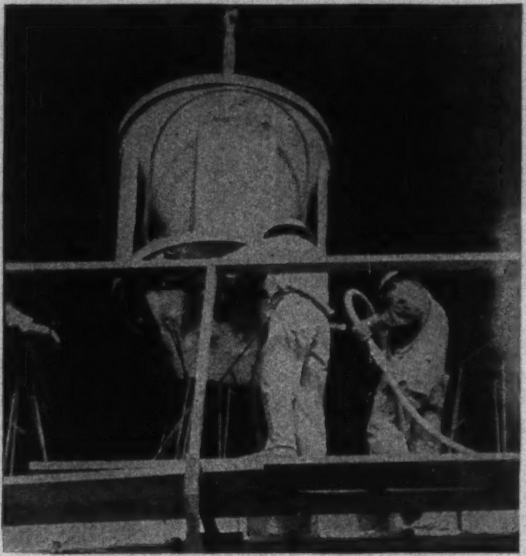
Perhaps a Michigan Tractor Dozer could speed production on *your* job. There are four models to choose from—162 to 600 hp. Also, check the matched Michigan Tractor Scrapers—same basic power train design, same engines, same controls. Call us for a no-obligation demonstration.

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division

CLARK EQUIPMENT

2401 Pipestone Road
Benton Harbor 34, Michigan
In Canada:
Canadian Clark, Ltd.
St. Thomas, Ontario

New Stow Hy-Cycle Vibrator Delivers *Twice* As Much Agitation as 60-Cycle Types!



Stow Hy-Cycle Vibrator Model 175
Agitating Concrete Mix in Wall Forms.

NO NEED HERE TO PATCH AND GROUT!

Striking demonstration of Stow's Hy-Cycle Vibrator power showed up on the site of Hoffman Construction's job for the City of Portland, Oregon.

Concrete walls and columns were specified for the new Municipal Recreation Center. Plans called for Walls 12″ thick, 16′ high, 150′ long and Finish Columns using 2½″ slump, 1″ aggregate concrete mix with Pozzolith and air-entrained additives combined.

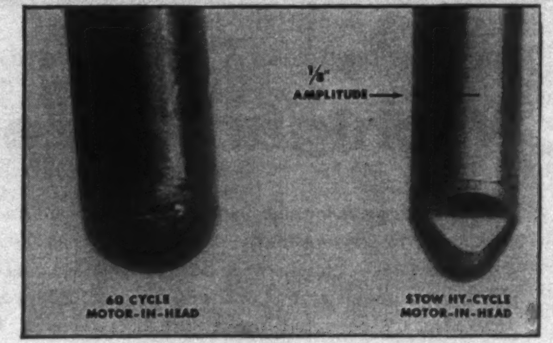
In constant operation 12 hours a day, the Hy-Cycle Vibrator thoroughly vibrated the stiff mix; agitating, compacting, eliminating voids and pockets. The result? Top-strength walls, smooth-finish columns—on schedule. No need here to patch and grout!

Hoffman Superintendent Ross Vickers says, "This job proved to us that Stow Hy-Cycle Vibrators are the most economical, smoothest operating vibrators we've ever used!"

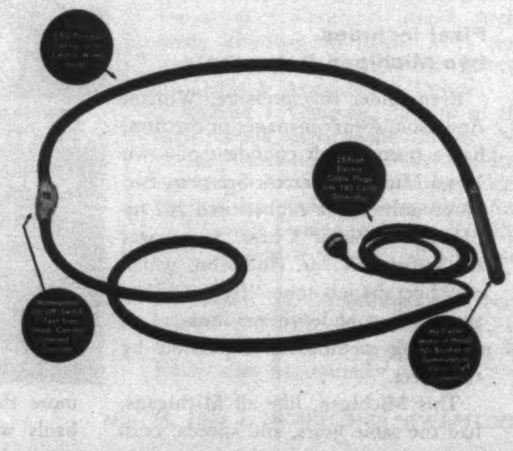
WHY THE DIFFERENCE? **Stow's Hy-Cycle motor-in-head unit has ⅛″ amplitude while the 60-cycle motor-in-head unit has 1/16 inch. And Stow's Hy-Cycle vibrators have the power to maintain this amplitude even in the stiffest mixes!**

ADJUSTABLE SPEED **Vibrations-per-minute can be set to suit the job by varying the HC Generator's engine speed. High speeds give you more power for dry, coarse mixes; slower speeds deliver reduced power for wet mixes, thin walls and light weight forms.**

VIBRATOR MOTOR-IN-HEAD **The Hy-Cycle motor is hermetically sealed within the Vibrator Head. No brushes or commutators to wear out, thus enabling Stow to design High Amplitude into the Heads.**



Hy-Cycle Vibrator Head and 60-Cycle Head Pictured at 10,000 VPM in Air. Note Greater Amplitude (Radial distance Head moves from Center Line) of H-C Model, ⅛″, as Compared to 1/16″ of 60-Cycle Model.



STOW MANUFACTURING CO.
Dept. N-1, 19 Shear St.
Binghamton, New York

Please send me your new Bulletin 5914 on Hy-Cycle Vibrators and Generators.

NAME .... TITLE ....
COMPANY ....
STREET ....
CITY.. STATE..............

STOW MANUFACTURING CO.

19 SHEAR ST. BINGHAMTON, N. Y.

Unit Prices

Prestressed cylinder pipe is chosen for . . .

Conduit from Whale Rock Dam

About 18 miles of 30-in. and 24-in. modified prestressed concrete cylinder pipe, and appurtenances, will go into the conduit to convey water from Whale Rock Dam, at Cayucos, Calif., to the city of San Luis Obispo.

Contractors were invited to bid on three pipe alternates. The first alternate was on modified prestressed concrete cylinder pipe, with rubber gasket joints. The other two alternates were for a pipeline constructed of electric-fusion-welded steel pipe—the first with rubber gasket joints and the second with welded slip joints.

Thirteen bidders priced the prestressed concrete cylinder pipe. The State Department of Water Resources, Sacramento, awarded the contract on that alternate, at $1,743,361, to N. P. Van Valkenburgh Co., Inc., bidding with Gunther & Shirley Co., El Monte, Calif.

The quantities given in the abstract are approximate. The Department of Water Resources reserves the right to increase or decrease the amount of any class or portion of the work, or to omit such portions as the engineer may deem necessary or desirable.

Concrete must contain a minimum of 5 sacks of cement per cu yd, and the water-cement ratio must not exceed 0.55 by weight.

Prevailing wages include: carpenter, $3.80; pipelayer for all non-metallic pipe, $3.29; tractor operator, including bulldozers, $4.06; trenching machine operator, $3.87; universal equipment operator—shovel, backhoe, dragline, derrick, clamshell or crane, $4.16; general laborer, $2.98.

The contractor must furnish all materials. Only truck transportation is accessible to the site.

The bidding on this conduit included:

1C	N. P. VanValkenburgh & Co., Inc., and Gunther & Shirley Co., El Monte, Calif	$1,743,361
2	R. V. Lloyd & Co., Coachella, Calif.	1,762,171
13	Geo. M. Brewster & Son, Inc., Bogota, N. J.	2,718,905

Bids: 2-10-60 Items	Unit	Quantity	Unit Prices 1 C	2
Trench excavation, uncl	cy	81,000	$0.83	$0.77
backfill, common	cy	56,400	0.55	0.54
select	cy	17,000	3.82	3.69
Rock refill	cy	320	9.00	9.50
Steel pipe, elec fusion weld, cmt mortar lined, syn enam ctd, w welded slip joints,				
30" ID, stl sht, 10 ga	lf	130	21.00	18.20
8 ga	lf	110	22.00	19.17
stl plate, 3/16"	lf	200	23.00	20.37
1/4"	lf	320	28.00	25.45
5/16"	lf	40	42.00	39.46
24" ID, stl sht, 10 ga	lf	3,000	15.50	11.30
stl plate, 1/4"	lf	380	28.00	23.65
Pipe outlets, threaded, 2"	ea	57	$19.00	$16.54
3"	ea	13	23.00	22.05
flanged, 6"	ea	61	66.00	61.74
12"	ea	2	208.00	198.43
20"	ea	8	440.00	424.85
8"	ea	*5	118.00	113.55
12"	ea	*2	258.00	248.04
Valve assembly, air release	ea	57	121.00	100.00
comb air release & intake	ea	14	166.00	167.50
Blowoff assembly, type I	ea	17	403.00	513.05
type II	ea	43	305.00	343.50
type III	ea	9	718.00	690.00
type IV	ea	1	400.00	467.00
Mech couplings for stl pipe,				
30" ID, non-insulating	ea	32	81.00	170.00
insulating	ea	15	125.00	240.00
24" ID, non-insulating	ea	2	75.00	175.00
insulating	ea	2	125.00	280.00
Concrete	cy	230	85.00	138.00
Reinforcing steel	lb	7,600	0.20	0.20
Welded stl, cmt mortar lined & ctd, reducer, 30"-20" ID	ea	1	590.00	430.00
enlarger, 20"-24" ID	ea	1	400.00	245.00
Flange & mech coupling assembly, 20"	ls	job	475.00	407.00
Vib sand backfill for support of substructures	cy	140	9.00	8.25
Asphaltic resurf, temporary	t	400	12.00	14.00
permanent	t	500	13.00	20.15
House sew conn, reconstruct	ea	28	150.00	117.00
Jacked casing	lf	110	80.00	91.00
Metering & deliv structs,				
Chorro-lateral	ls	job	11,000	18,200
Calif St Polytechnic Coll	ls	job	5,500	6,700
San Luis Obispo	ls	job	7,900	8,250
Butterfly valve, 20"	ea	1	1,250	1,085
Test station, corrosion	ea	13	95.00	85.00
insulation joint	ea	15	133.00	106.00
Bond station	ea	5	96.00	85.00
Valve vault	ea	1	822.00	505.00
Mod prstr conc cyl pipe, rub gasket jt, 30" ID, cl 230	lf	14,000	13.40	13.33
cl 240	lf	1,500	13.65	13.55
cl 260	lf	2,600	14.00	13.89
cl 280	lf	2,700	14.35	14.29
cl 300	lf	1,800	14.70	14.96
cl 320	lf	5,800	15.00	14.90
cl 340	lf	3,300	15.35	15.29
cl 360	lf	4,800	15.70	15.63
cl 380	lf	6,700	16.00	15.97
cl 400	lf	7,100	16.20	16.14
cl 420	lf	3,500	17.00	16.98
cl 440	lf	4,500	17.50	17.31
cl 460	lf	2,000	17.70	17.71
cl 480	lf	490	18.00	23.87
cl 500	lf	140	18.20	18.22
Mod prstr conc cyl pipe, asph mastic underct w bonded rubber gasket jts, 30" ID, cl 230	lf	5,600	15.85	16.23
Mod prstr conc cyl pipe, w rub gasket jts, 24" ID,				
cl 230	lf	1,100	10.90	11.38
cl 280	lf	630	11.40	11.88
Stl pipe, elec fusion weld, cmt mortar lined, asph mastic ctd, w bonded rubber gasket joints,				
30" ID, cl 230	lf	490	15.25	15.24
cl 240	lf	70	15.00	15.24
cl 260	lf	140	14.50	15.24
cl 280	lf	170	14.50	15.24
cl 300	lf	680	16.50	17.31
cl 320	lf	1,200	16.70	17.31
cl 340	lf	900	17.30	17.88
cl 360	lf	1,800	17.30	17.88
cl 380	lf	1,400	17.85	18.66
cl 400	lf	2,600	18.15	19.00
cl 420	lf	1,000	18.15	19.00
cl 440	lf	3,400	19.55	20.42
cl 460	lf	2,200	19.55	20.42
cl 480	lf	570	21.50	21.47
cmt mortar lined & ctd, w rub gasket jts, 12"ID, steel sheet, 10 ga	lf	4,100	7.00	6.57
Add girth welds for pipe,				
30" ID	ea	6	75.00	31.05
24" ID	ea	4	60.00	24.84
12" ID	ea	4	35.00	16.20

* With companion blind flange

Awarded: 3-11-60.
Completion schedule: 360 cal days.
Liquidated damages: $300/cal day.

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. . . that will help you slice estimating time to a minimum, while maintaining maximum accuracy.

Both manuals are by John S. Page and Jim G. Nation

ESTIMATOR'S PIPING MANHOUR MANUAL

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Areas covered in 10 Sections include: Shop Fabrication of Pipe and Fittings; Field Fabrication and Erection; Alloy and Non-Ferrous Fabrication; Underground Piping; Hangers and Supports; Painting; Patent Scaffolding; Insulation; Sample Estimate; Technical Information.

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Areas covered in 15 Sections include: Conduit, Boxes and Fittings; Service and Feeder Wiring; Branch Circuit Items; Lighting Fixtures; Panelboards and Cabinets; Safety Switches; Hangers and Fasteners; Underfloor and Buss Ducts; Starters and Motors; Mounting Transformers; Outside Construction; Underground Duct and Cable; Communication and Signal Systems; Demolition; Excavation and Concrete; Technical information.

The scores of man-hour tables in each manual contain literally thousands of easy-to-use listings. These listings are valuable guides to estimating man-hours in every phase of electrical or piping installation. They are the result of hundreds of time-and-method studies, coupled with actual labor cost on numerous projects.

With these manuals you'll know how to arrive at a composite rate using productivity efficiency and production elements. With the composite rate, man-hour estimating can be applied with equal validity to any electrical or piping installation and fabrication job, in any location.

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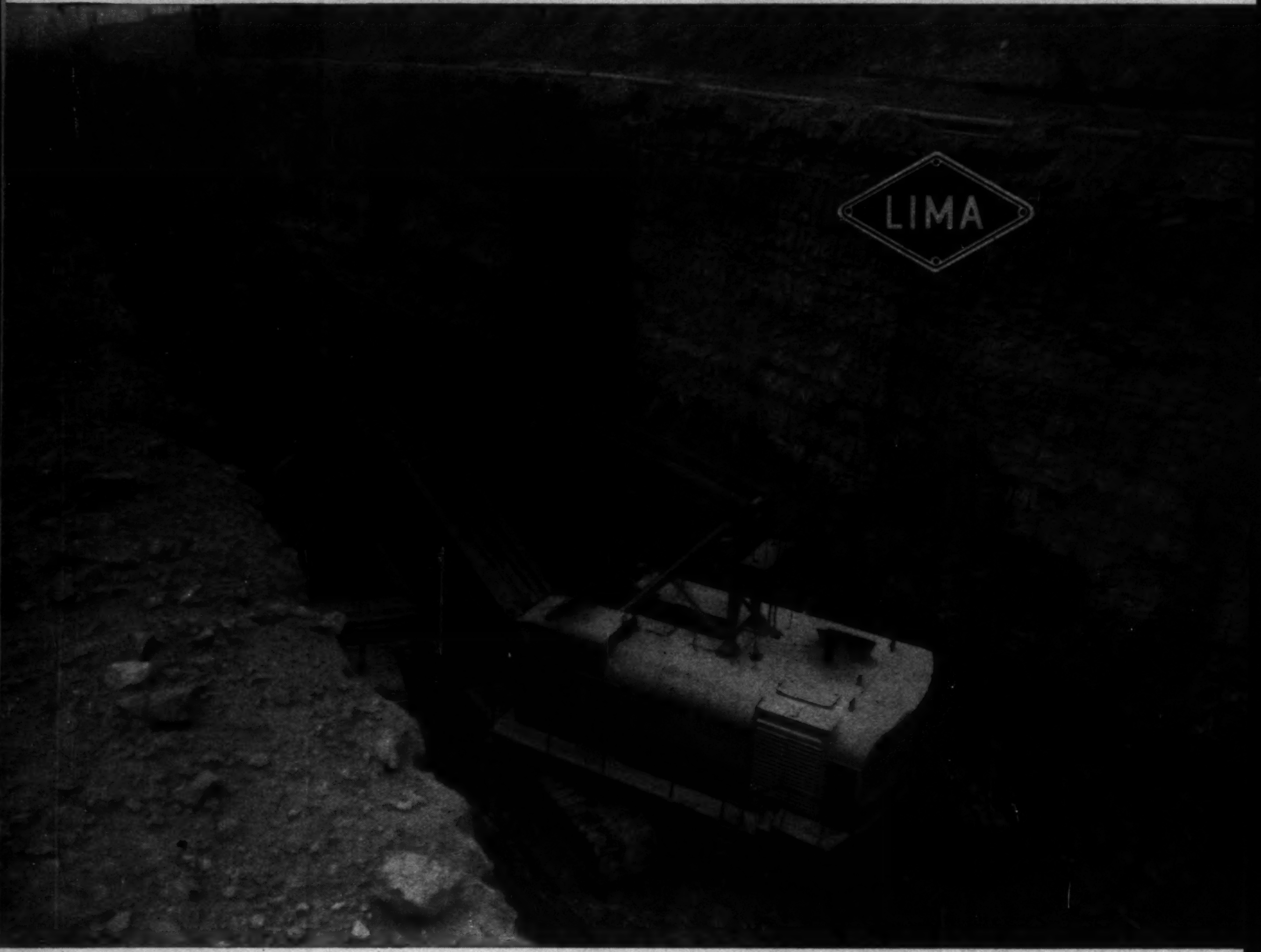
HOW 23 LIMAS HAVE HELPED BUILD NIAGARA POWER PROJECT

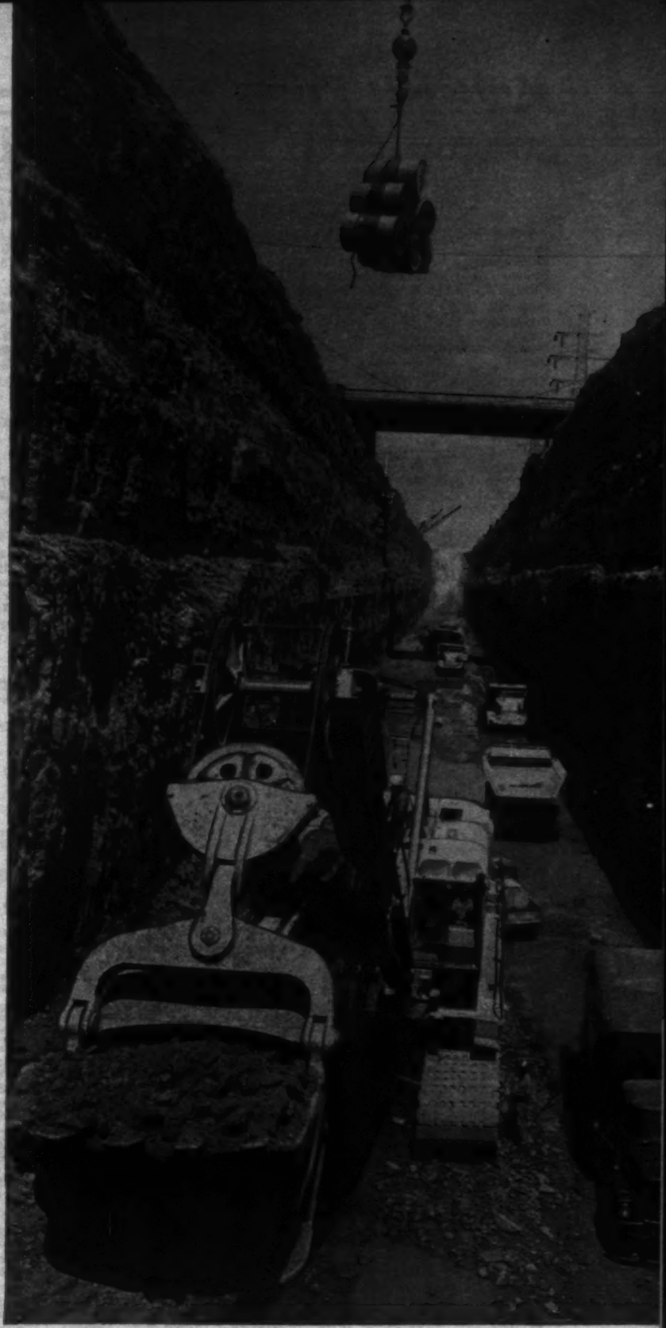


Herculean task begins as this 6-yd. Lima shovel starts excavation for 2,000,000-kw Niagara Generating Plant—scheduled for mid-1962 completion. It's one of five giant Lima Type 2400's assigned the task of moving almost 10 million yards of rock. For the big, tough jobs on any project, you're almost certain to find Limas chosen to keep work on schedule.

Millions of yards moved and many months later, the Limas are still at it—whittling down the 314-ft. cliff and forcing it back 300 ft. from the Niagara River along a front of 1840 ft. Lima dependability and consistent high output can be directly traced to superior quality of design, workmanship and materials. All bearings above machinery deck are anti-friction roller bearings; heat-treated alloy shafts are splined; induction hardening of all wearing parts increases parts life; steel bases are cast in one piece.

Lima dragline (top) begins excavation at intake site above falls. Water will be channeled from intake to reservoir and generating plant via 22,000-ft. underground conduit, 46 ft. wide, 66 ft. deep. Limas easily convert to shovels, cranes, draglines, pullshovels.

110-ton Lima crane (above) makes easy work of setting concrete form in place. Same rig later pours concrete. Booms of two Lima Type 1250-SC Cranes form archway over Niagara's "big ditch." Booms are of alloy steel with tube lacing spliced to angles for greater strength.



Limas demonstrate ability to outperform other equipment because they are better built; deliver years of trouble-free service. That's why four Niagara contractors are using a total of 23 Limas! Why not look into Limas for your jobs—crawler shovels to 8 yd.; cranes to 140 tons, 75 tons on rubber; draglines variable. See your nearby Lima distributor for facts, figures or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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LIMA Construction Equipment Division, Lima, Ohio

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BALDWIN BLH LIMA-HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

Materials Prices

Monthly Market Quotations By ENR Field Reporters

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over. 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over. 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper, Carload lot. Hydrated finishing	Common hydrated	Pulverized
Atlanta........	$186.10pe	$154.95pkbe	$309.90pe	$348.65pe	......	......	$33.20uu	$36.70uu	$36.50hh	$28.50hh	$28.50hh
Baltimore......	217.00	231.00	434.00	491.00	602.00	690.00	36.00	41.00	35.80	23.40	.....
Birmingham....	135.00pes	152.00pes	......	303.00p	376.00p	465.00p	27.00ff	38.00jj	38.28mm	30.87mm	36.33pmm
Boston.........	232.00†mm	248.00†mm	463.25†mm	556.00†mm	......	......	43.50p	58.00p	42.00§	34.00§	.....
Chicago........	137.00ll	149.00ll	280.00ll	......	......	......	32.00	34.00	38.00ll	35.20ell	.....
Cincinnati......	179.00mmjvv	190.00jmmvv	355.00jddmm	390.00jmmvv	422.00jmmvv	500.00jmmvv	48.00jk	47.00jk	29.10jmm	29.10jmm	29.10jmm
Cleveland......	205.00tt	219.00tt	......	465.00tt	......	709.00tt	41.75tt	45.75ggtt	32.75ptt	28.00ptt	.....
Dallas..........	155.00	155.00	306.00	370.50	452.25	560.00	30.00	50.00	41.80	34.58	28.80
Denver.....mm	170.00	185.00	310.00	310.00	390.00	442.00	35.00zz	54.00	48.00p	42.00p	46.00p
Detroit........	257.00mm	274.00mm	514.00mm	582.00mm	767.00mm	876.00mm	53.50pmm	54.00pmm	38.00mm	30.00mm	40.00mm
Kansas City.mm	158.00	158.00	312.00	312.00	400.00	500.00	34.00	34.00	36.26	34.26	29.76
Los Angeles....	r	r	r	r	r	r	38.00uu	.....	38.00nnll	38.00nnll	39.00nnll
Minneapolis....	208.00pe	225.00pe	452.00pe	225.00pwe	......	......	49.00vpe	57.50vpe	50.00bbe	40.00bbe	52.00bbde
Montreal.......	168.78auqoo	180.93auqoo	325.00auqoo	220.00qoo	400.00qoo	......	48.25bll	56.30bll	39.00	22.00	13.25
New Orleans...	198.00	198.00	370.00	370.00	......	......	42.00	55.00	44.00	32.00	32.00
New York......	185.00h	197.00h	294.00ch	297.00hn	......	......	46.00p	.....	40.00p	38.00p	.....
Philadelphia....	202.10ss	215.60ss	404.20sszz	485.10ss	......	......	42.00mm	50.00mm	40.00mmp	21.50	21.50
Pittsburgh...pp	200.00t	213.00t	400.00t	453.00t	607.00t	693.00t	39.00t	46.00t	38.00t	33.00t	34.00t
St. Louis.......	180.00mmpp	190.00pp	385.00pp	401.00ppp	459.00pp	621.50pp	44.00mmpp	45.50pp	1.00aapp	.80aapp	1.35aapp
San Francisco..	156.85*mm	177.10*mm	235.30dd*mm	159.40qqmm	......	......	43.00*mm	43.00*mm	29.24mm	29.24mm	31.74mm
Seattle.........	235.00pt	270.00pt	490.00pt	265.00pwt	......	......	57.00t	71.00t	52.00bbt	38.00bbt	4.50mbbt
Toronto	158.00rr	173.00rr	336.00rr	263.00frr	378.00rr	......	27.00rr	65.00rr	42.00mm	38.00mm	36.50mm

•§ F.o.b. yard. •• F.o.b. plant Stockton. •† F.o.b. yard Roxbury. •a Smooth. •b $4.50 del. •c 8 x 12 x 12 in.-6 cell. •d Pulverized hot. •e less 5% disc., 10th., •f 8 x 8 x 12. •g Lumps, $26.72. •h F.o.b. trucks, job site N.Y.C. •i 50 lb sacks. •j Truck load or over. •k $1.00 discount per M, 10 days. •l Red face. •m Per bb . 180 lb. processed. •n 7¾ x 7¾ x 12. •o Mason's double hydrated pressure. •p Truck lots. •q Provincial and Municipal tax extra (6%). •r Not used: earthquake danger. •s 8 x 16 x 12. •t less 2% disc., cash. •u Incl. Federal tax. •v Sand lime. •w 5 x 8 x 12. •x dumped. •y Chi common. •z Pebble; 80 lb sack. •aa 50 lb sack. •bb LCL •dd 8 x 12 x 12. •ff 80% common. •gg Smooth. •hh less 25¢ disc., cash. •ii F.o.b. plant. •jj rough; smooth; $40. •kk 3⅓ x 11½ x 11½. •ll less 2% disc. 10th. •mm less 2%, 10 days. •nn F.o.b., L. A. •oo less 2%, 30 days. •pp add 2% sales tax. •qq 8 x 5⅓ x 11½. •rr 2½% disc., 10 days. •ss 5% disc., 10 days. •tt less 2% disc., 15th. •uu less 50¢/M, 10 days •vv 4000 pcs. and over.

PAINT, ROOFING—F. O. B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600 lb. (Approx.) bbl. F.O.B. Plant Dry a C	WHITE LEAD Per 100 lb. in 100 lb. cases in oil	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced. 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta........	$13.75ggJO	$24.00ggJ	$3.59	$3.86	$3.31	$3.90kk	$3.25kk	$3.85kk	$0.67kk	$65.35kk
Baltimore......	17.50lpp	24.00	3.00	4.40	3.50	3.06	3.67	4.04	.50	54.00
Birmingham....	26.00†J	29.00†J	3.90J	3.40J	....	2.95†mm	2.17ii†mm	3.17ii†mm	.70ffmm	48.00eemm
Boston.........	24.95†oomm	26.90†mmm	....	....	....	3.70q	2.45g	3.83g	.55g	58.00g
Chicago........	15.25rJqqrp	24.00†J	....	....	....	3.45ukk	2.50okk	3.00okk	48.00bbukk	57.70†kk
Cincinnati......	15.25†JO	24.00†J	....	....	....	2.87mm	2.02omm	2.42omm	.428ymm	55.96Hmm
Cleveland......	25.65†	26.90†	2.61ggP	2.78saqq	3.43qqq	2.74q	2.11o	2.42o	.39y	49.00qq
Dallas..........	22.50	23.50M	....	3.25B	....	3.00u	3.00o	3.00o	.470	66.00hh
Denver.........	23.00n	24.00	3.98	5.20	3.70	2.71	1.93o	2.80o	.50ff	50.00
Detroit.........	15.75r	24.00rr	2.70mm	3.95mm	2.70mm	2.82mm	2.05omm ll	2.42omm ll	.56ffmm	49.00mm
Kansas City....	26.90lggoo	25.65	3.99	3.43	3.01	4.60mm	3.13omm	3.13omm	.92y	.....
Los Angeles....	16.25yy	22.00	3.30n	4.50n	4.20n	3.40nkk	2.40niikk	l	.75nykk	l
Minneapolis....	16.75N	21.50kk	....	....	....	2.50kk	1.95hikk	2.36hikk	.52ikk	50.00rkk
Montreal.......	19.45O	26.00wtt	5.52Dfft	6.55xff	5.10kfft	5.40	4.65f	4.65f	1.60	4.40uu
New Orleans...	23.00Jpp	24.00J	....	....	....	2.78	1.98	2.85	.680	45.50
New York......	15.25ooO	29.75	....	....	....	2.79zz	2.05zzo	2.46o	.52s	49.00*
Philadelphia ...	16.25Omm	24.75mm	3.35mm	3.90mm	2.65Rmm	4.70	3.60	2.85	.515	50.00
Pittsburgh......	21.00mggJ	24.00J	2.20ƒEJ	2.25ƒFJ	2.25ƒGJ	3.57sH	2.75sH	2.95H	.48H	55.00H
St. Louis.....K	25.65†m	26.90	....	....	....	3.28iimm	2.35hh K	2.82hh K	.43y K	62.00 K
San Francisco...	26.70mm	26.90mm	3.20mm	4.30mm	3.50mm	2.87mm	1.72aaiimm	2.59mm	.48jj	54.00
Seattle..........	13.35HO	24.00H	....	4.19ccffJ	....	3.70gccH	3.06hccH	....	.59cc	.....
Toronto.........	14.70	20.65	5.15J	6.15J	5.95J	3.25	2.75aas	2.75o	1.01j	56.00A

•† Delivered. • Note: Red lead in oil 50% higher than white lead in oil. •• Aver. wt. approx. 425 to 550 lb drums. •a Red lead prices change frequently due to pig lead price changes. •b U.S. War Dept. Spec. 3-49A. •c ASTM Spec. D266-31. •d 80% minimum ferric oxide. •e Per 108 sf roll. •f Per 432 sq ft. •g F.o.b. yard Roxbury. •h Per roll, 65 lb. •i Net carload prices, Minneapolis and vicinity. •j 45 gal containers. •k Over 80% ferric oxide. •l Not used. •m 100 lb. keg. •n F.o.b. city. •o Per 60 lb roll. •p 6-drum, 50 gal each. •q Per 90-lb roll. •r F.o.b. factory, Chicago. •s Truckload. •t Incl. Federal tax. •u Per 90-lb square. •v Per ton. •x Ready-mixed. •y 55-gal container. •z Drums. •aa 15 lb. •bb Roofers coating and cement. •cc LCL, truck delivery. •ee Asphalt pitch in 100 lb package •ff 5-ga drums. •gg F.o.b. factory. •hh Incl. freight. •ii Per 324 sf roll. •jj Asbestos roof coating. •kk less 2% disc., 10th. •mm less 2% disc., 10 days. •oo 100 lb bbls. •pp 50 or 100 lb bags. •qq 500 lbs or more •rr F.o.b. plant, Detroit. •ss 50 lb bbls. •tt 25 lb kegs. •uu 250 lb bbls. •xx Sept.: Rolls revised to $2.75, Asph. Felt revised to 1.71. •yy Sept. revised to $12.00. •zz Sept. revised to $2.80. •A 400 lb barrels. •B ASTM Spec. D962-49. •C 95%. •D Std. black. •ƒ Mill. spec.: E TTP27; F TTY81; G TTP31. •H less 2% disc., cash. •I Per 100 lb. •J less 1% disc., 10 days. •K add 2% sales tax. •L CL. •M 1 ton or more. •N under 500 lbs, add $1. •O 50 lb. bag.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡ Neat per ton	Gauging per ton	VERMICULITE‡ Home Insulation pellets (per bag of 4 cu ft)	Plaster aggregate (per bag of 4 cu ft)	Concrete Aggregate Untreated (per bag of 4 cu ft)	PERLITE‡ Plaster Aggregate (per bag of 4 cu ft)	Concrete Aggregate Untreated (per bag of 4 cu ft)	ALUMINUM Flat .100" th 36"x108" & 48"x144" per lbjt	SHEET† Corr roof .032" th 35"x12' per shu	STAINLESS STEEL† SHEET-TYPE 302g 20 ga 48"x96"-120" per cwthh	28 ga 36"x120" per cwtmm	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ⅝"b	½"c
Atlanta........	$32.00ss	$42.00ss	$1.55sss	$1.65sss	$1.80slss	$1.65ss	$1.65ss	$0.463noo	$27.17nY	$65.68nzz	$74.43nzz	$0.1762ss	$0.2464ss
Baltimore......	24.00	35.70	0.95	1.15	1.15	1.15	1.55	0.462	0.451r	63.00	71.25	0.16	0.23
Birmingham....	37.00ss	43.00ss	1.55ss	1.55ss	1.60lss	1.27ss	1.27lss	0.455M	9.62K	65.54K	73.79K	0.20ss	0.27ss
Boston.........	24.00	30.00	1.40	1.40	1.40	1.55ss	1.55ss	0.462	24.66pAA	64.42dd*zz	72.67dd	0.1762ss	0.2464ss
Chicago........	26.80tt	26.80tt	1.55	1.60	1.60l	1.60	1.60	0.516s	32.88p	64.15ee	72.40ee	0.1814	0.2545
Cincinnati......	23.85*ss	23.85*	1.75*ss	1.75*ss	1.85*ss	1.85ss	1.90ss	0.514	9.21	65.30zz	74.05zz	0.1814ss	0.2545ss
Cleveland.......	28.00N	45.00N	1.14ss	1.16ss	1.24lss	1.45ss	1.45ss	0.455aa	8.48	63.33oozz	71.58oozz	0.1814tt	0.2545tt
Dallas..........	30.65	30.65	1.05	1.21	1.37	1.21	1.32	0.463	0.461r	64.09	72.34	0.1668	0.1986
Denver.........	27.00	27.00	1.50	1.40	1.50	1.50ss	1.60ss	0.475	10.89	65.32gg	73.57gg	0.1772	0.2380
Detroit.........	28.00ss	28.00ss	1.27ss	1.31ss	1.40ss	1.45ktt	1.50ktt	0.475a	10.35a	63.00azz*	71.25azz*	0.2058	0.2887
Kansas City....	30.00	35.00	1.19E	1.21E	1.29lE	1.21	....	0.463	24.66ggvvp	67.50E	76.25E	0.1814	0.2545
Los Angeles....	27.00tt	28.00tt	1.25ktt	1.20kt	1.45tt	1.11	1.11	0.515	9.77Z	65.02	73.27	0.1814	0.2545
Minneapolis....	35.00F	35.00F	1.65tt	1.80F	1.95F	1.40S	1.50S	0.485	16.23	63.61GR	69.61ffG	0.1446j	0.2025
Montreal........	27.60h	35.60h	1.25h	1.40h	1.60h	1.15s	1.15s	43.95AH	12.10H	65.75H	.....	0.1978	0.2089
New Orleans...	34.00	48.00	1.25P	1.35P	1.45P	1.21P	1.21P	0.463	24.90	64.00Y	85.60Y	0.1814	0.2545
New York.......	27.00	35.00	1.40	1.35	1.40	1.35	1.45	0.485aT	0.2466aXAA	64.08s	72.33a	0.1814R	0.2545R
Philadelphia....	26.50	31.00ss	1.40ss	1.40ss	1.55lss	1.35ss	1.35qqss	0.485	9.46	63.71	71.96	0.1814	0.2545
Pittsburgh......	30.00nn	33.00nn	1.50nn	1.50nn	1.50mm	1.50nn	1.50nn	0.452	9.46	64.00	76.25pp	0.1600	0.1800
St. Louis ....uu	30.00uu	42.00uu	1.50uu	1.60uu	1.65uu	1.50uu	1.60uuY	0.475	10.69	63.39Kmmgg	69.39yuugg	0.1814fmss	0.2545fmss
San Francisco..	29.50ss	30.50ss	1.38ss	1.38ss	1.50ss	1.38oss	1.58oss	0.575	10.83	65.00K	77.25K	0.1814	0.2545
Seattle.........	42.40nn	45.60nn	1.55nn	1.35knn	1.85lnn	1.50k	....	0.46D	10.40D	54.02D	73.27D	0.1756	0.2460
Toronto........	.82	1.31	1.10	1.12	1.30	1.20Q	....	0.4295	26.00ap	73.74	86.52	0.3063	0.3418

‡truckiots, delivered †fob warehouse •fob city •a delivered •b ½" O.D. •c ⅝" O.D. •d per sf •e 34" x 60" sheet •f per 100 ft •g 5 tons & up: cold roll, anneal & pickled 2B finish •h incl. Federal tax •i add 25¢ for pint of additive •j 1100 & 3003 alloy, mill finish •k bag of 3 cu ft •l treated with air entraining agent •m 2-10M ft •n fob mill fr equalized with nearest stocking competitor •o 250 sacks or more •p 100 sq ft •r per lb •s 30 lb bag •t 36" x 108";-10.81 lb/sh; 48" x 144"; 21.7 lb/sh •u 19.31 lb/sh •v fob plant •w 48" x 144" •x 0.11"th •y 27 gauge •aa 16M lb & up •bb Per 50 lb bag •dd add $1.00 cwt boxing •ee 4 tons & up •gg add $2/cwt boxing; $0.75/cwt on skids •hh Theoretical wt for 48" x 96"; 60.4-lb. per sh •ii 300-bag lots •jj 100-lb bag •mm Theoretical wt; 19.7-lb per sh •nn 2% cash •oo skid packed •pp type 304 •qq Philadelphia and suburbs. •rr less 2% disc. 15 days. •ss less 2% disc. 10 days. •tt less 2% disc. 10th. •uu add 2% sales tax. •vv Type N. •xx less ½% disc. 10 days. •yy .021 ga. •zz .061" th. •A Per 100 lb. •C 15M lb. •D less ½% for cash. •E Quantity differential. •F less 5% disc. 10th. •G less ½% disc. 10th. •H Fed. tax exempt. •K less ½%, 10 days. •L 5% disc. 30 days. •M 3003; .452 for 1100. •N less 2%, 15th mo. •O less $2, cash & carry. •P less 2%, 15 days. •Q per ton. •R revised •S add .10/bag under 200 bags. •T 5000# quantity on 4000# skids. •U 30 Msf quantity; $0.245 in 10 Msf quantity. •X per sq ft. •Y Per sheet. •Z 6,000 lb or over. •AA 30,000 sf or over.

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports,
J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Mass., Norwood**—HOSPITAL ADDN.—BA 6/1—Norwood Hospital Bd. Trustees, 729 Washington St., hospital addn., alterations. $1,750,000. Date advanced. Plans deposit $100. James H. Ritchie & Assoc., 135 Clarendon St., Boston, archts. CD 5/11.

▲ **Conn., Wallingford**—SCHOOL—BA 6/16—Town, Town Hall, 1, 2 and 4 story, 80,000 sq. ft., steel, brick, concrete West Side Junior High School, Hope Hill Rd. $1,800,000. Plans deposit $50. Ketchum, Gina, Sharp, Unger & Unger, 219 E. 44th St., New York, N. Y., archts. Philip A. Merian, 356 S. Orchard St., engr. CD 7/9.

BUILDINGS—SLC

▲ **Mass., Boston** — MOTOR INN — The Church Realty Trust, 15 Norway St., Boston, soon lets contract Midtown Motor Inn, 220 Huntington Ave. $1,500,000. Samuel Glaser Assoc., 234 Clarendon St., archts. CD 5/3.

HEAVY CONSTRUCTION—LB & CA

▲ **Petricca Constr. Co.**, 534 West St., Pittsfield, Mass., LB **$1,052,945**, est. $1,000,000, Contr. No. 1, main intercepting sewers, PITTSFIELD, MASS. City, Dpt. P. Wks., 33 Pearl St., Pittsfield, Mass., Bids May 13, CD 4/19;
E. T. O'Neill & Sons Constr. Corp., P. O. Box 863, Holyoke, Mass., LB **$1,476,673**, est. $1,500,000, Contr. No. 2, Eastern Interceptor Sewer (Pittsfield, Mass.).

▲ **CONNECTICUT**—State Hy. Dpt., 170 Douglas St., Hartford,
L. G. Defelice & Son, Inc., Nettleton Ave., North Haven, Conn., CA **$3,313,874**, 14,518 ft. dual lane concrete pavement relocation Rte. 8, incl. 25-span bridge over Rte. 67, FAI Proj. F (38). Bids Apr. 11. CD 4/13, under LB.

BUILDINGS—LB & CA

▲ **Olson & Appleby, Inc.**, 222 Union St., New Bedford, Mass., LB **$2,020,999**, REGIONAL HIGH SCHOOL, Center and Mt. Prospect Sts., BRIDGEWATER, MASS. Bridgewater-Rayham Regional School Dist., Town Hall, Bridgewater, Mass. Bids May 14. CD 4/26.

▲ **Albert Swanson**, 39 Whitney Ridge Terrace, Hamden, Conn., Owner Builds, **$1,746,000**, 95 HOUSES, Benham Lake Heights, Lane and Benham Sts., HAMDEN, CONN. CD 4/20/56.

▲ **Town of Seymour**, Town Hall, Seymour, Conn., cancelled bids to have been opened May 19, HIGH SCHOOL, Bungay Rd., SEYMOUR, CONN. **$1,500,000.** CD 5/12.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **D. C., Wash.**—STADIUM—BA 6/1—Procurement Officer D. C. National Guard Armory, 2001 E. Capitol St., 50,000 seat stadium west end of E. Capitol St. Bridge, east of Armory, Plans deposit $200. Extended date. Praeger-Kavanagh, 126 E. 38th St., Waterbury 16, N. Y., Osborne Co., 7016 Euclid Ave., Cleveland, O., George Dahl, 2101 N. St. Paul St., Dallas, Tex., and Ewin Engineering Corp., 1367 Connecticut Ave. N. W., Wash., D. C., archts.-engrs. CD 4/14.

▲ **D. C., Wash.**—BA 6/8—D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., "K" St. Expressway, 20th St. to 25th St. N.W. Plans deposit $50. CD 8/28/58.

BUILDINGS—BA

▲ **Pa., Danville**—HOSPITAL ADDN.—BA 6/2—George F. Geisinger Memorial Hospital, hospital addn., alterations. $2,500,000. Ellerby & Co., 333 Sibley St., St. Paul, Minn., archts. CD 5/26/58.

▲ **N. Y., Cold Spring Harbor**—SCHOOL, etc.—BA 6/15—Bd. Educ. Central School Dist. No. 2, Towns of Huntington and Oyster Bay, Main St., Cold Spring Harbor, Junior-Senior High School, field house and site development. $1,700,000. Plans deposit $120 general, $60 mechanical trades. Sherwood Mills & Smith, 65 Broad St., Stamford, Conn., archts.

▲† **D. C., Wash.**—DOMICILIARY—BA 6/21—U. S. Eng., 1st and Douglas Sts. N. W., Zone 25, 7 story, approx. 209,750 sq. ft. rein.-con., masonry walled Domiciliary, pile fdns., Soldiers Home, ENG-49-080-60-61(67). Plans deposit $7.50. CD 5/10.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Dpt. P. Wks., State Office Bldg., Albany,
John Arborio, Inc., W. Cedar St., Poughkeepsie, N. Y., CA **$2,098,009**, 9 in. c. conc. pavt. variable width misc. work 0.2 mi. acc. c. conc. pavt. 0.77 mi. b. conc. 0.47 mi. Int. Rte. 505, Pennsylvania State Line, Five Mile Point (Penn.-N. Y. State Line to Sunset Dr.), Rte. 81 FISH 60-3P, Proj. I 81-1(6), Broome Co. Bids Apr. 21. CD 4/22, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,
Perini Corp., 73 Mount Wayte Ave., Framingham, Mass., CA **$2,414,863**, est. $2,958,000, b. conc. pavt. 2.33 mi., grad., drain 1.57 mi. Lestershire SH 125 Hooper-Johnson City, SH 5699, Rte. 17C, FARC 60-17, Proj. U-401(9), U-1143 (2), Broome Co. Bids Mar. 24, awarded Apr. 18. CD 3/25, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,
N. Y.—**Yonkers Contg. Co., Inc.**, 969 Midland Ave., Yonkers, N. Y., CA **$2,812,443**, est. $3,436,000, b. conc. 7.17 mi., misc. work 0.1 mi. City of New York Board of Water Supply Rd. No. 1 (Cannonsville Reservoir), Rte. 10 BWS 60-2, Delaware Co. Bids Apr. 21, awarded May 6;
N. Y.—**Vernon Christiana, Jr.**, Box 413, Utica, N. Y., CA **$794,476**, est. $928,000, b. conc. Type 1A 6.12 mi., misc. work 0.05 mi. Richfield Springs-Getman Corners, Pt. 2, SH 1818 Rte. 28 FARC 60-22, Proj. S-493 (1), Herkimer Co. Bids Apr. 21, awarded May 11. CD 4/22, under LB.

▲ **Joseph Halpern**, 34-12 9th St., Long Island City, N. Y., LB **$1,489,094**, est. $1,412,960, (3 bidders), general contract sewage treatment plant and lift station, Inwood, MINEOLA, N. Y. Bd. Supervs. Nassau Co., Old County Court House, Mineola, N. Y. Bids May 17. CD 5/4.

▲ **Horn Constr. Co.**, 2174 Hewlett Ave., Merrick, N. Y., LB **$1,635,417**, est. $1,300,000, Trevor Park, incl. road from Warburton Ave. to Hudson River, bridge

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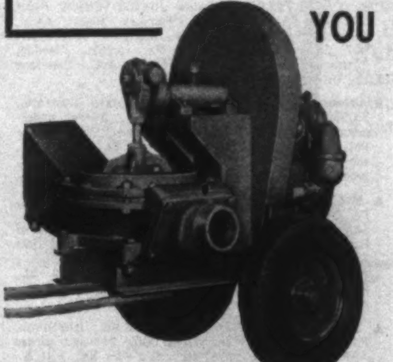

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Pumps 10,000 G.P.H.
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Made in 30- and 50-ton capacities, the tongs have a ¼-inch minimum jaw opening, 1¼-inch maximum. Each jaw has a series of teeth to insure positive gripping. The 30-ton tongs weigh roughly 1,150 pounds, the 50-ton tongs about 1,650 pounds. Connecting brackets are furnished to fit the particular type of extractor being used.

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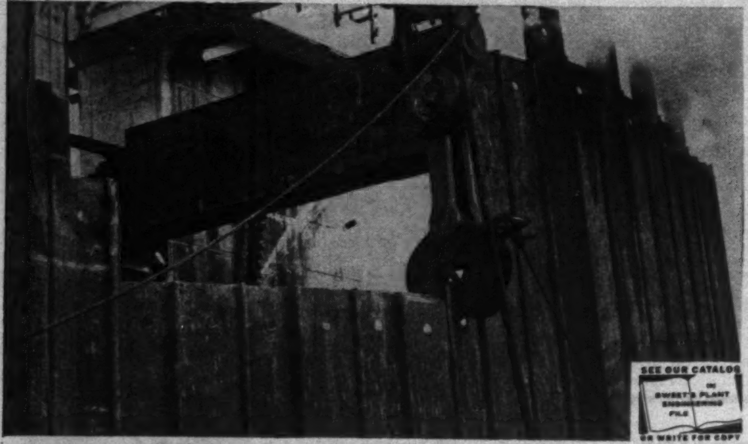
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▲ **Elmhurst Contracting Co., Inc.**, 53-09 97 Place, Corona, N. Y., LB **$1,473,593**, (13 bidders), Unit No. 1 local flood control protection works along Brodhead and McMichaels Creeks, Stroudsburg and East Stroudsburg Boros, Stroud Twp., Monroe Co., PENNSYLVANIA. Dpt. Forest & Waters, 512 Education Bldg., Harrisburg, Pa., Bids May 13. CD 4/1.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
F. A. Canuso & Sons, Inc., 173 W. Roosevelt Blvd., Phila. 20, Pa., CA **$2,347,884**, 28,268 ft. divided hy. c. conc., 3 bridges T.R. 3, W. Chester Boro, W. Goshen, E. Goshen and Westtown Twps., Chester Co. Bids Apr. 28, awarded May 13. CD 5/3, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened 5/12,
Pa.—**G. A. & F. C. Wagman, Inc.**, 370 E. Main St., Dallastown, Pa., LB **$4,076,571**, est. $4,729,200, (12 bidders), 17,376 ft., 4-lane rein.-con. divided hy., 6 bridges, Sec. 1A, L.R. 793, Proj. 729-1, City of Reading, Cumru and Exeter Twps., Berks Co.;
Penn Jersey Contractors, Inc., 1100 South Broad St., Trenton, N. J., CA **$768,302**, constr. Main and Auxiliary West End Diversion Conduits, Local Protective Works, Bethlehem, IFB CIVENG-26-109-60-19, PENNSYLVANIA. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. CD 9/30.

BUILDINGS—LB & CA

▲ **F. D. Rich Co., Inc.**, 550 Summer St., Stamford, Conn., CA **$2,433,798**, general contract BUILDING 9, Department of Taxation and Finance, State Office Bldg., Campus Site, ALBANY, N. Y. Henry A. Cohen, dir. Bureau Contracts, State Office Bldg., Albany, N. Y. Bids Mar. 9. CD 3/16, under LB;
E. W. Tompkins Co., Inc., 158 Orange St., Albany, N. Y., CA **$814,312**, heating work Building No. 9 (Albany, N. Y.).

▲ **Mar-Mes Constr. Co., Inc.**, 271 North Ave., New Rochelle, N. Y., CA **$1,389,000**, general contract alterations, addns. to existing HIGH SCHOOL and ELEMENTARY SCHOOL, BRONXVILLE, N. Y. Bd. Educ., 200 Pondfield Rd., Bronxville, N. Y. CD 11/13;
A. B. Barr & Co., Griver St., Yonkers, N. Y., CA **$524,267**, heating and ventilating for High School and Elementary School addns., alterations (Bronxville, N. Y.).

▲ **Howard Builders**, 3143 New Walden Ave., Depew, N. Y., Owner Builds, **$2,000,000**, 110 HOMES, French Rd. and Geo. Urban Blvd., Transit Heights, BUFFALO, N. Y. CD 12/15/58.

▲ **Fred Brotherton, Inc.**, 185 Atlantic St., Hackensack, N. J., CA **$1,500,000**, RESIDENCE HALL on campus, CALDWELL, N. J. Sisters of St. Domonick Caldwell College, Bloomfield Ave., Caldwell, N. J. CD 10/2.

▲ **Whyte Co.**, 671 Oradell Ave., Oradell, N. J., LB **$1,839,660**, White Beeches Drive SCHOOL and Honiss SCHOOL addn., DUMONT, N. J. Bd. Educ., New Milford Ave., Dumont, N. J. Bids May 12. CD 5/5, under LB.

▲ **Turner Constr. Co.**, 1500 Walnut St., Phila., Pa., CA **$2,000,000**, DEPARTMENT STORE, HADDONFIELD, N. J. Strawbridge & Clothier, 8 and Market Sts., Phila., Pa. Victor Gruen, 2 W. 13 St., New York, N. Y., archt. George M. Ewing Co., Western Savings Fund Bldg., Phila., Pa., assoc. archt.

▲ **Coburn Farms**, 206 S. 42 St., Phila., Pa., Separate Contracts, **$1,470,000**, RESIDENTIAL DEVELOPMENT, Rte. 352 and vicinity, BROOKHAVEN, PA. Irvin Stein, 7 Stateion Dr., Paoli, Pa. archt.

▲ **Frank H. Wilson Co.**, 125 Coulter Ave., Ardmore, Pa., CA **$1,500,000**, SCHOOL for mentally retarded, BROOMALL, PA. R. C. Archdiocese of Phila., 225 N. 18 St., Phila., Pa. Bids Apr. 29. CD 4/29.

▲ **W. A. Clarke Co.**, 6841 Market St., Upper Darby, Pa., Separate Contracts, **$3,240,000**, RESIDENTIAL DEVELOPMENT, (216 homes), Rte. 452 Jct. in Ashton Twp., CHESTER, PA. Erling H. Wenge, McClachy Bldg., Upper Darby, Pa., archt.

▲ **Ablonsky Constr. Co.**, 924 Richmond St., Painesville, O., CA **$1,750,000** Fairview JUNIOR-SENIOR HIGH SCHOOL, FAIRVIEW, PA. Fairview School Auth., Fairview, Pa. Meyers, Krider, Merle & Ellenberger, 407 Commerce Bldg., Erie, Pa., archts. Fleming, Pfitzmeier & Weeks, 1900 Euclid Ave., Cleveland 15, O., engrs.

▲ **Leonard Polis**, Trevose, Pa., Separate Contracts, **$3,500,000**, 13 story APARTMENT, 2-level underground GARAGE, 47 St. and City Ave., PHILA., PA. Philocles Antholpoulic, 1737 Chestnut St., Phila., Pa., engr. Leon Levin, 1923 Manning St., Phila., Pa., archt.

▲ **McCloskey & Co.**, 1620 W. Thompson St., Phila., Pa., LB **$3,073,000**, UNDERGRADUATE LIBRARY, SEMINAR and CLASSROOM BLDG. for University of Pa., PHILA., PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids May 11. CD 4/25;
Ambrose-Augusterfer Corp., 247 E. Ashmead St., Phila., Pa., LB **$922,000**, heating, ventilating and air-conditioning for library, etc. (Phila., Pa.).

▲ **Sixty Nine Hundred Corp.**, 301 York Rd., Jenkintown, Pa. Separate Contracts, **$2,500,000.**, 200-unit garden APARTMENTS, swimming pool, Old York Rd., PHILA., PA.

▲ **Cambridge Constr. Co.**, 2 Arthur Rd., Rosemont, Pa., Separate Contracts, **$2,280,000**, RESIDENTIAL DEVELOPMENT, Mount Pleasant Ave., etc., VILLANOVA, PA.

(Continued on page 86)

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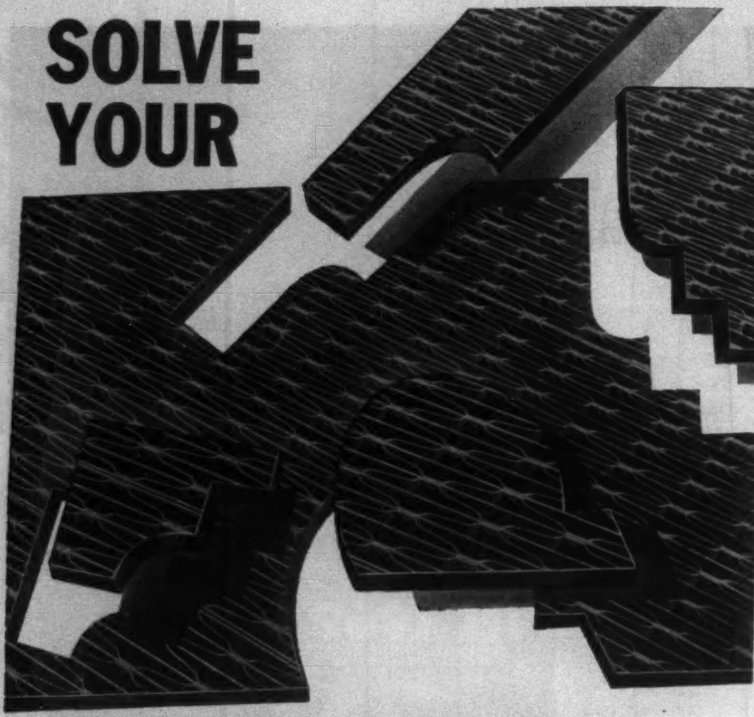

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1863 10th St., OAKLAND 20, CALIFORNIA

▲ **Richard H. Riss, Sr.**, c/o Gerald Kerr, 3 E. Lexington St., Baltimore 2, Md., Owner Builds, **$1,670,556,** concrete block WAREHOUSE, Sulphur Spring Rd., near LINTHICUM, MD.

▲ **American Mortgage Investment Co.**, Woodward Bldg., Wash., D. C., Owner Builds, **$2,000,000,** 6 story, brick, concrete, steel Old Georgetown Inn HOTEL, parking GARAGE, 1310 Wisconsin Ave., WASH., D. C. CD 10/9.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Fla., Orlando** — RUNWAY AND TAXIWAYS — BA About 6/23—U.S. Eng., Box 4970, Jacksonville, Zone 1, strengthening existing runway and taxiways by removing existing pavement and replacing with c. conc. pavement, widening existing runway 50 ft. each side with flexible pavement, grading shoulders of runway and taxiways, installing approach lighting system at south end of runway and narrow gage lighting system for the entire runway, rehab. existing runway and taxiway lights, McCoy Air Force Base, Pinecastle, ENG-08-123-60-75. $5,500,000. CD 9/24/58.

BUILDINGS—BA

▲ **Ky., Covington**—SCHOOL—BA 6/15—Kenton County Bd. Educ., high school, Taylor Mill Rd. $900,000. CD 9/11/58, under Ky., Independence.

HEAVY CONSTRUCTION—LB & CA

▲ **WEST VIRGINIA**—State Road Comn., Charleston, Zone 5, Bids opened 5/12,

W. Va.—**C. F. Repogle Co.**, P. O. Box 308, Circleville, O., LB **$1,364,236,** c. conc. paving 4.785 mi. Interstate 64 from US 60 Interchange to Barboursville Interchange, Proj. I-64-1(10)13, Cabell Co.;

W. Va.—**V. N. Green & Co., and Central Asphalt Paving Co.**, 914 Nelson Bldg., Charleston 1, W. Va., LB **$1,631,057,** c. conc. paving 5.731 mi. Interstate 77 from White Chapel to Goldtown Interchange, Proj. I-77-3(22)113, Jackson and Kanawha Counties;

▲ **FLORIDA**—State Rd. Dpt., Tallahassee,

Fla.—**Harbert Constr. Co.**, Box 1369, Birmingham, Ala., CA **$3,973,318,** 6 lane divided 9 in. c. conc. pavement 8 in. limerock base Type I, b. conc. surf. course, binder course, 6½ in. limerock base shoulder with Type 1-B surf. tr. 0.77 mi. State Rte. 400, FEI Proj. No. I-4-2(24) 100 Job No. 7528-3417 and State Jobs Nos. 75280-3501 and 75040-3503, Orange Co.;

Fla.—**Wainer Constr. Co.**, Box 1172, Valdosta, Ga., CA **$1,351,749,** 4-lane 9 in. c. conc. pavement 8½ in., sand clay base Type 1-B surf. tr. and Type II b conc. surf course 6½ in. sand-clay paved shoulders with Type 1-B surf. tr. 2.159 mi. State Rte. 8, FAI Proj. No. I-10-1(7)11 Job No. 48260-3403, Escambia Co. Bids Feb. 23, awarded May 12. CD 3/2, under LB.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee,

Hubbard Constr. Co., Box 7217, Orlando, Fla., CA **$1,956,564,** 4-lane divided facility 10½ in. limerock base, Type I, b. conc. surf. course with binder course and surf. tr. 7.146 mi. SR 500, State Proj. Jobs 75020-3109 and 11010-3111, Orange and Lake Counties. Bids Mar. 29, awarded May 9. CD 4/1, under LB.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee,

W. R. Fairchild Constr. Co., Box 31, Hattiesburg, Miss., CA **$1,093,727,** 4-lane divided 8 in. shell stab. base Type 1-B bit. surf. tr. binder course and Type 1 b. conc. surf. course (3 in. thick) 3.959 mi. State Rte. 397, 85 and 20, FAI Proj. F-F-041-1(3), Jobs Nos. 57040-3115 and 57050-3110, and State Jobs Nos. 47040-3501 and 57050-3501, Okaloosa Co. Bids Feb. 23, awarded May 13. CD 3/2, under LB.

▲ **Harbert Constr. Corp.**, 2208 8th Ave. S., Birmingham, Ala., LB **$6,651,900,** constr. Pearl River Valley Dam, etc., JACKSON, MISS. Pearl River Water Supply Dist., P. O. Box 2045, Jackson, Miss. Bids May 12. CD 4/12.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Talbott Constr. Corp., 30 Wall St., Winchester, Ky., CA **$2,906,127,** grading, draining bit. surf. 2.985 mi. Lexington-Catlettsburg Rd. 0.318 mi. Winchester-Parish. F-511 (4) I-64-5 (9) 90, Clark Co. Bids May 6. CD 5/10, under LB.

BUILDINGS—LB & CA

▲ **Paul Tishman Co., Inc.**, 21 E 70 St., New York, N. Y., LB **$1,770,949,** (5 bidders), LIBRARY, NORFOLK, VA. City, City Hall, Norfolk, Va., Bids May 13. CD 4/25.

▲ **Ebasco Services, Inc.**, 2 Rector St., New York, N. Y. CA, design and construct Quaker Neck Steam-Electric PLANT addn., GOLDSBORO, N. C. Carolina Power & Light Co., 419 Fayetteville St., Raleigh, N. C. Total est. **$8,000,000.** CD 3/28;
Riley Stoker Corp., 9 Neponset Ave., Worcester 6, Mass., CA, BOILER, (Goldsboro, N. C.);
Westinghouse Electric Corp., 2 Gateway Center, Pittsburgh, Pa., CA, turbine generator (Goldsboro, N. C.).

▲† **H. L. Coble**, 1705 Battleground Ave., Greensboro, N. C., LB **$5,496,000** (6 bidders), 367 unit CAPEHART HOUSING, No. 3, ENG-31-075-60-25, FORT BRAGG, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids May 17. CD 4/25.

Hicks & Vogel Constr. Co., 4236 Atlanta Blvd., Jacksonville, Fla., CA **$699,772,** petty officers mess (open) Part 1; commissioned officers mess (open) Part II; indoor recreational facilities, Part III, NBy 16569, Spec. 16569/59, MAYPORT, FLA. Dist. P. Wks. Office, Bldg. 13, Naval Base, Charleston, S. C. Bids Apr. 27, awarded May 10. CD 5/3, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **MICHIGAN and ONTARIO**—BA 6/14—International Bridge Authority, 801 Seymour St., Sault Ste Marie, Mich.,

substruction and superstructure Contracts 1 & 2, International Bridge between Sault Ste Marie, Mich., and Sault Ste Marie, Ont. Total cost $20,000,000. D. B. Steinman, 117 Liberty St., New York 6. N. Y., engr. CD 6/15/54.

▲ **MICHIGAN and ONTARIO**—BA 6/15—International Bridge Auth., 801 Seymour St., Sault Ste Marie, Mich.,

Canadian section International Bridge between Sault Ste Marie, Mich., and Sault Ste Marie, Ont. CD 6/15/54.

▲† **Michigan and Ontario**—BA 6/17—U. S. Eng., 1101 Washington Blvd., Detroit 26, Mich., dredging, Lower Livingstone Channel, CIVENG-20-064-60-80. $7,000,000. Plans deposit $1.30. CD 9/29/59.

† **Illinois**—BA 6/21—U. S. Eng., Clock Tower Bldg., Rock Island, Lima Lake Drainage Dist. (Main Stem Levee) Flood Control Proj., Mississippi River, Adams Co.; along left bank of Mississippi River, CIVENG-11-117-60-32, $600,000. CD 9/15.

▲ **Ill., Chicago**—BA 6/21—Dpt. Purchases, City Hall, Zone 2, No. 80.391-60-2, surf. wash piping, Central Dist. Filtration plant, $1,300,000. George S. Salter, ch. design engr. CD 1/12/59.

MICHIGAN and ONTARIO—BA 6/22 — International Bridge Authority, 801 Seymour St., Sault Ste Marie, Mich.,

Canadian approach span, International Bridge, between Sault Ste Marie, Mich., and Sault Ste Marie, Ont. CD 6/15/54.

BUILDINGS—BA

▲ **Wis., Milwaukee**—SEMINARY—BA 6/7—Milwaukee-Downer Seminary, 2513 E. Hartford Ave., seminary, River Hills. $1,000,000-$2,000,000. Kloppenburg & Kloppenburg, 5906 N. Port Washington Rd., archts. CD 1/27.

▲ **O., Cincinnati**—SCHOOL—BA 6/15—Bd. Educ., 608 E. McMillan St., Aiken Senior High School. Plans deposit $50. A. M. Kinney, Inc., 2912 Vernon Pl., archt-engr. CD 3/4.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

The Penker Constr. Co. & DeSalvo Constr. Co., Inc., 1030 Summer St., Cincinnati, O., CA **$4,189,066**, Type T-71, structures 2.014 mi. State Rte. 4, Section 18.43, U-681 (18) US 1262 (1), City of Dayton, Montgomery Co. Bids Apr. 26. (**Correction**—contractor). CD 5/17, under CA.

Haddad Constr. Co., 568 Wilson Ave., Columbus, O., CA **$704,534**, 2 mi. section Maplecrest-South Park Sewer, Parma and Seven Hills, CLEVELAND, O. Bd. Comrs. Cuyahoga Co., County Admin. Bldg., 1219 Ontario St., Cleveland 13, O. Bids Feb. 25, awarded May 13. CD 3/9.

Milburn Bros., Inc., Central Rd., Mt. Prospect, Ill., CA **$659,584**, No. 115-0103, c. conc. road paving, Kirchoff Rd., 11,503 ft. storm sewers, curb and gutters, Des Plaines, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago 2, Ill. Bids May 3, awarded May 16. CD 5/9, under LB.

▲ **Raymond International, Inc.**, 140 Cedar St., New York 6, N. Y., CA **$1,873,775**, est. $800,000, No. 80.78-60-2, pier constr. extens. and widen Navy Pier, South Dock, State 4, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. Bids Mar. 8, awarded May 12. CD 4/13, under LB.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing,

S. J. Groves & Sons, 3700 Carpenter Rd., Ann Arbor, Mich., CA **$3,158,270**, 5.4 mi. expressway and seven structures from M-50 in Dundee north to Ann Arbor R.R. tracks, Monroe Co.; CA **$1,265,762**, 3.1 mi. northbound lane US 23 expressway and 3 structures from Ann Arbor R.R. tracks north to Milan, Monroe Co. Bids Apr. 6. CD 4/12, under LB.

▲ **MICHIGAN**—State Hy. Dpt., 732 Mason Bldg., Lansing,

Mich.—**S. D. Solomon & Sons**, 3760 Elizabeth Lake Rd., Pontiac, Mich., CA **$2,781,347**, 4.7 mi. US 16 freeway Int. 196 from Leffingwell Ave. westerly to Cheney Ave. incl. five structures, Kent Co. CD 4/29;

Mich.—**Gilliland Constr. Co.**, Rte. No. 2, Alpena, Mich., CA **$2,339,023**, 8.9 mi. of US 27 freeway from Arnold Rd. about 3 mi. north of Harrison in Clare Co. north to Wolf Creek about 3 mi. north of Clare-Roscommon Line incl. dual bridge at Townline Creek, Clare and Roscommon Counties. CD 5/6;

Mich.—**Johnson-Greene Co.**, 416 E. Huron St., Ann Arbor, Mich., CA **$2,788,703**, 10.1 mi. US 27 freeway from Wolf Creek north to M-55 at Houhton Lake incl. interchange at M-55 dual bridges at Wolf Creek and extension of M-55 from existing US 27 to freeway, Roscommon Co. CD 5/6;

Streets & Roads Constr. Corp., 1226 W. Wisconsin Ave., Milwaukee 3, Wis., LB **$509,538** (6 bidders), 185,000 sq. yd. soil cement base, 22,500 tons bit. concrete pavement, 24,000 ft. curb and gutter, SOUTH MILWAUKEE, WIS. City, City Hall, South Milwaukee, Wis. Bids May 12. C. Dinauer, South Milwaukee, Wis., city engr.

BUILDINGS—BA

▲ **Hunkin-Conkey Constr. Co.**, 1740 E. 12th St., Cleveland 14, O., LB **$1,900,000** (3 bidders), SCHOOL, CLEVELAND, O. Cleveland Institute of Music, 3411 Euclid Ave., Cleveland 15, O. Bids Apr. 26. CO 1/11.

Kaiser Building Corp., 1412 Hayden Ave., Cleveland 12, O., Owner Builds, **$800,000**, 40 HOMES, HUDSON, O.

▲ **Abell Howe Co.**, 53 W. Jackson St., Chicago 4, Ill., CA **$2,000,000**, 185,000 sq. ft. FACTORY, 17th Ave., 22nd St., BROADVIEW, ILL. Elkay Mfg. Co., 1874 S. 64th Ave., Cicero, Ill. Awarded May 10.

▲ **H. L. Vokes Co.**, 1000 Wayside Rd., Cleveland 10, O. CA Est. **$1,500,000**, FAMILY SPORTS CENTER, Eastgate Shopping Center, MAYFIELD HEIGHTS, O. Morris Coen & Leo Bilsky, c/o Mayflower Lanes, 13961 Cedar Rd., Cleveland 18, O. CD 4/4.

▲ **Edward J. DeBartolo & Assocs.**, 2620 Market St., Youngstown, O., Own Forces, **$10,000,000**, Great Lakes SHOPPING MALL, MENTOR, O. CD 9/10.

▲ **F. A. Wilhelm Constr. Co.**, 3914 Prospect St., Indianapolis, Ind., LB **$1,359,165**, general contract, HEATING PLANT and utilities, West Lafayette, LAFAYETTE, IND. Purdue University, Executive Blvd., West Lafayette, Ind., Bids Apr. 20, CD 3/31;
Freyn Bros., Inc., 1028 N. Illinois St., Indianapolis, Ind., LB **$1,504,000**, mechanical work for heating plant, (Lafayette, Ind.).

▲ **S. N. Nielsen Co.**, 3059 W. Augusta Blvd., Chicago, Ill., CA **$2,000,000**, 3 story, concrete frame HOSPITAL, Kaplan Surgical Wing, CHICAGO, ILL. Michael Reese Hospital, 29th and Ellis Ave., Chicago, Ill. Bids Mar. 22, awarded May 4. CD 3/16.

▲ **Charles L. Schrager Co.**, 30 W. Monroe St., Chicago 3, Ill. Owner Builds, **$2,000,000**, MOTOR FREIGHT TERMINAL, 4900 W. 55th St., CHICAGO, ILL. Jensen & Jensen, 30 W. Monroe St., Chicago 3, Ill., archts. Central Wisconsin Motor Transport Co., lessee. Awarded May 13.

▲ **Paul H. Schwendemer**, 7555 South Chicago Ave., Chicago, Ill., CA **$1,500,000**, brick, stone HOSPITAL addn., CHICAGO, ILL. South Chicago Community Hospital, 2320 E. 93 St., Chicago, Ill. CD 8/1/58.

▲ **Nelson & Co.**, 1550 Yout St., Racine, Wis., LB **$1,628,000**, (4 bidders), general contract F. R. Starbuck JUNIOR HIGH SCHOOL, RACINE, WIS., Bd. Educ., Racine, Wis. Bids May 9, CD 4/12.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲ **Colo., Denver**—BA 6/1—Bd. Water Comrs., 144 W. Colfax St., material only, 40,000 ft. 72 in. diam. and 3,000 ft. 90 in. diam. steel or concrete conduit for Conduit No. 29, $1,900,000; material only, 10,000 ft. 72 in. diam. steel or concrete pipe Conduit 28, Part No. 2, $450,000. R. B. McRae, ch. engr. Denver Bd. Water Comrs., mgr. CD 10/9.

▲ **Neb., Omaha**—BA 6/7—P. Wks. Dpt., City Hall, 18 and Farnam Sts., North Interceptor Sewer. Over $2,000,000. Plans deposit $25. Kirkham-Michael & Assocs., 508 S. 19 St., Zone 2, engrs. CD 12/10/58.

▲† **Ark., Little Rock**—HANGAR—BA 6/16—U. S. Eng., P.O. Box 867, Little Rock, 75,000 sq. ft. hangar for Arkansas Air National Guard, Little Rock Air Force Base, ENG-03-050-60-53. $1,500,000. Plans deposit $10. CD 5/16.

BUILDINGS—BA

▲ **Minn., Wabasha**—HOSPITAL—BA 6/1—St. Elizabeth Hospital, 50-bed hospital addn., convent facilities, etc. $1,500,000. M. Pfaller Assocs., 7613 West State St., Milwaukee, Wis., archts. CD 7/26/57.

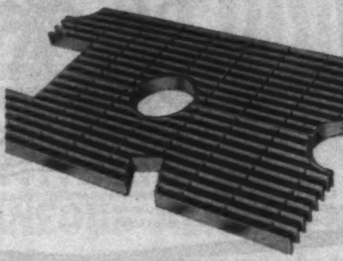
▲ **Mo., St. Louis County**—PLANT—BA About 6/1—Crown Zellerbach Corp., 2101 Williams St., San Leandro, Calif., general contract 245,000 sq. ft. plant for flexible packing materials in Hazelwood area near Lambert-St. Louis Municipal Airport for use by Western-Waxide Div. (Waxide Paper Co.). $2,000,000. C. G. McDonald, 6363 Airport Way, Seattle, Wash., owner's ch. engr. CD 3/6/57.

▲ **Tex., Andrews**—HIGH SCHOOL—BA 6/3—Andrews Independent School Dist., high school. $2,000,000. Reid, Rockwell, Banwell & Tarics, 1019 Market St., San Francisco, Calif., archts.-engrs. CD 4/14, under LB.

▲ **Mont., Billings**—STUDENT SERVICES, etc.—BA 6/8—State Bd. Regents, Helena, 6 story student services, incl. dormitory, dining hall, student union, Eastern Montana College of Education. $2,000,000. Orr, Pickering & Assocs., Fratt Bldg., Billings, archts. CD 12/29.

HEAVY CONSTRUCTION—LB & CA

▲† **Massman Constr. Co.**, 3917 Broadway, Kansas City 11, Mo., and **Frazier-Davis Constr. Co.**, 1319 Macklind Ave., St. Louis 10, Mo., LB **$2,943,044**, est. $4,822,378 (5 bidders), constr. Chain of Rocks Low Water Dam No. 27 across Mississippi River, rock fdn., rock fill over sheet steel pile, cells, stone bank protection, crushed stone access road, etc., CIVENG 23 065-60-43, MISSOURI-ILLINOIS. U. S. Eng., 420 Locust St., St. Louis 2, Mo. R. W. Booker & Assocs., 215 N. 11th St., St. Louis 1, Mo., engrs. Bids May 12. CD 4/8.



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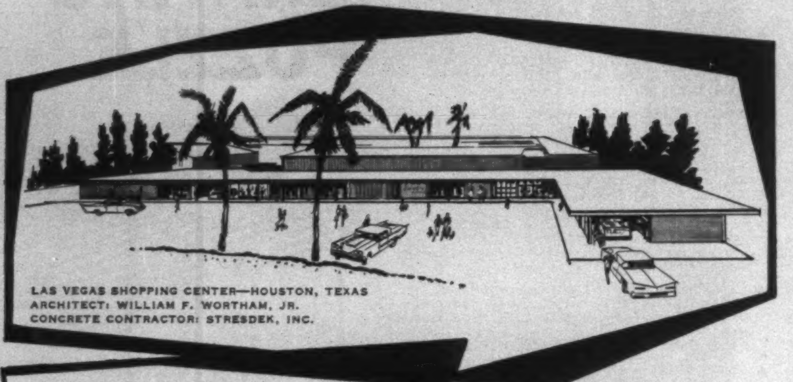
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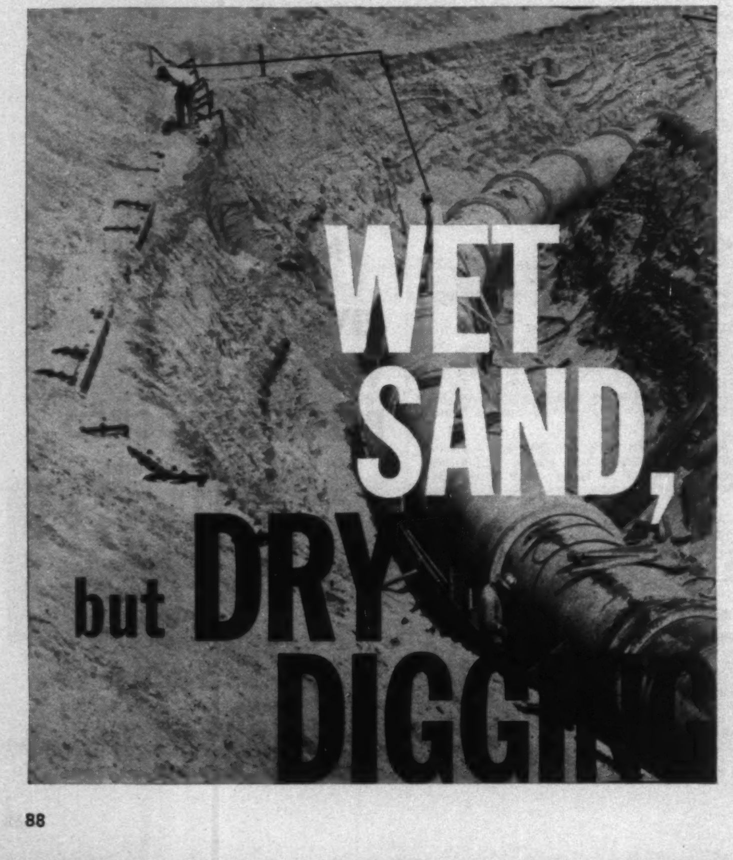

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▲† **Al Johnson Constr. Co.**, 608 Foshay Tower, Minneapolis, Minn., and **Peter Kiewit Sons Co.**, 1024 Omaha Nat'l. Bank Bldg., Omaha, Neb., CA **$6,897,840**, dam overflow section at Dardenelle Lock and Dam, Arkansas River, near Dardenelle, ENG-03-050-60-53, ARKANSAS. U. S. Eng., 300 Broadway, Little Rock, Ark. Bids May 5. CD 5/9, under LB.

▲ **Western Pipe Line, Inc.**, V. F. W. Bldg., Austin, Tex., CA Est. **$3,000,000**, 52 mi. 21 in. gas line from Brown-Bassett Field, Terrell Co. to Puckett Field, Pecos Co., TEXAS. El Paso Natural Gas Co., El Paso National Gas Co. Bldg., El Paso, Tex.

▲ **San Jacinto Co.**, 2311 10th St., Denver, Colo., LB **$1,587,819**, est. $1,822,563, FAI Proj. 9-05.010-22, bit. paving overlay, runway at Stapleton Field, DENVER, COLO. City and County of Denver, City and County Bldg., Denver, Colo. Bids May 10. CD 5/6.

▲ **R. B. Potashnick**, P.O. Box 423, Cape Girardeau, Mo., CA **$10,815,430**, est. $15,770,445, Schedule 2, Dillon Dam, Blue River Proj., DENVER, COLO. Denver Bd. Water Comrs., 114 W. Colfax St., Denver, Colo. Bids Oct. 8. CD 11/4, under CA.

BUILDINGS—LB & CA

▲ **Borson Constr., Inc.**, 7700 Logan Ave. S., Minneapolis, Minn., CA **$1,630,900**, general contract four ELEMENTARY SCHOOLS, ST. PAUL PARK, MINN. Bd. Educ. Independent School Dist. No. 833, St. Paul Park, Minn. Bids Apr. 28. CD 5/12, under LB;
Healy Plumbing & Heating Co., Inc., 278 West Kellogg Blvd., St. Paul, Minn., CA **$996,700**, mechanical contract covering four schools and addns., alterations to elementary school and one high school addn. (St. Paul Park, Minn.).

▲ **Bd. Educ. Independent School Dist. 833**, St. Paul Park, Minn., rejected bids Apr. 28, ELEMENTARY SCHOOL and SENIOR HIGH SCHOOL addns., alterations, ST. PAUL PARK, MINN. Will re-advertise. CD 5/12, under LB.

▲† **S. S. Silberblatt, Inc.**, 25 West 45th St., New York, N. Y., LB **$12,085,200**, est. $12,571,429, (3 bidders), 800 units Capehart HOUSING, ENG-23-028-60-84, FORT LEONARD WOOD, MO. U. S. Eng., 1800 Federal Office Bldg., Kansas City, Mo. Bids Apr. 7 rejected, LB $12,569,874. New bids May 13. CD 4/14, under LB.

▲ **Rosenblum Constr. Co.**, 11304 Olive St. Rd., Creve Coeur 41, Mo., Owner Builds, **$4,500,000**, Parke Town APARTMENTS, COMMUNITY CENTER, SWIMMING POOL, etc., Lucas and Hunt Rd. between West Florissant Rd. and Mark Twain Expressway, ST. LOUIS COUNTY, MO. J. Richard Shelley, c/o contractor, archt.

▲ **Knutson Constr. Co.**, 2138 Welch St., Houston, Tex., LB **$6,167,000**, HOSPITAL, HOUSTON, TEX. Methodist Hospital, Texas Medical Center, 6516 Bertner St., Houston, Tex. Bids May 10. CD 4/21.

▲ **Texas Prison Bd.**, Main Admin. Bldg., Austin, Tex., Owner Builds, **$5,000,000**, Ferguson PRISON FARM, 14 mi. from Huntsville; **$3,750,000** PRISON, 7,700 acres, 12 mi. from Huntsville, HUNTSVILLE, TEX. CD 8/27.

▲ **R. G. Farrell Co.**, Box 137, Odessa, Tex., CA **$1,809,000**; BANK and OFFICE, ODESSA, TEX. First National Bank of Odessa, 2101 N St. Paul St., Dallas, Tex. Bids May 3. CD 5/17.

▲ **Mead & Mount Constr.**, Denver Club Bldg., Denver, Colo., CA **$3,111,000**, 2 MEN'S DORMITORIES, LARAMIE, WYO. University of Wyoming, Campus, Laramie, Wyo. Bids May 10, awarded May 11. CD 5/16, under LB.

▲ **H. B. Bolas Enterprises, Inc.**, Littleton, Colo., Owner Builds, **$10,000,000**, 560 RESIDENCES, Happy Homes Brighton, BRIGHTON, COLO.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **California**—BA 6/2—Oroville-Wyandotte Irrigation Dist., P. O. Box 229, Oroville, four earth and rockfill dams, three concrete dams, reconstr. dam, 17 mi. of tunnels, 11,000 ft. penstocks, three hydroelectric plants, 23 mi. of power and irrigation canals, access roads, Feather River Proj. Butte, Plumas and Yuba Counties. $50,000,000. Extended date. Bechtel Corp., 101 California St., San Francisco, engrs. CD 3/22.

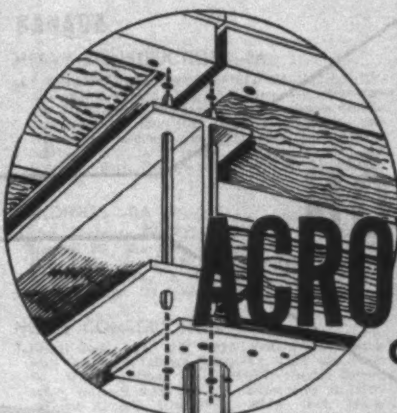
▲ **Calif., Marysville**—BA 6/6—Linda County Water Dist., Hy. 99 East, Sanitary Sewage Project; clay pipe sewer, clay pipe sewer lateral, c.i. pipe force main, manholes, 4 pumping stations, etc., Linda County Water Dist. $2,100,000. Plans deposit $25. Dean S. Kingman, P.O. Box 1280, Palo Alto, engr. CD 2/8.

▲† **Ariz., Yuma**—MAINTENANCE HANGARS—BA 6/9—Eleventh Naval Dist. P. Wks., 1220 Pacific Hy., San Diego 1, Calif., maintenance hangars, mess hall, MCAAS, Spec. No. 24698, $1,000,000-$2,500,000. CD 10/1.

BUILDINGS—BA

▲† **Calif., Travis Air Force Base**—HOUSING—BA About 6/10—Base Procurement Office, Travis Air Force Base, Fairfield, 600 units Housing No. 3, Angus McSweeney, 2960 Van Ness, San Francisco, archt. CD 6/10.

▲ **Ore., Portland**—POSTAL TERMINAL—BA 6/20—U.S. Post Office Dpt., 511 NW Broadway, construct and lease postal terminal. Stanton, Boles, Maguire & Church, Concord Bldg., archts.



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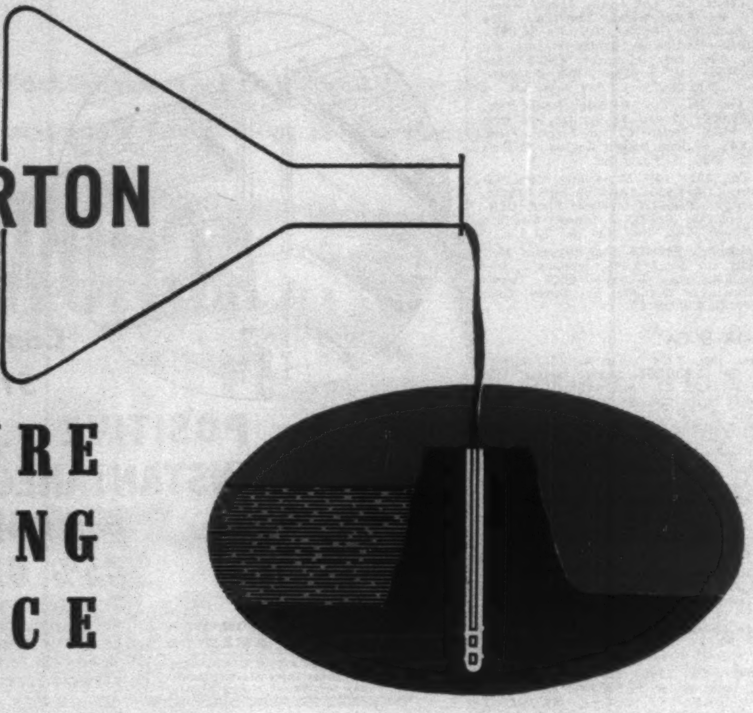

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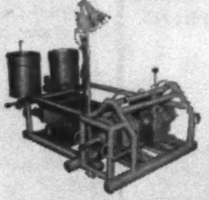

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Evansville, Ind.	HA 3-6208
Corpus Christi, Texas	TU 4-6614
Wichita, Kansas	AM 5-8611
Los Angeles, Calif.	HU 3-2302
Lubbock, Texas	PO 5-5725
New Orleans, La.	JA 2-0304
Houston, Texas	CA 7-8164
Dallas, Texas	RI 1-3841
Shreveport, La.	2-9523
Denver, Colorado	AL 5-0461
New York, N. Y.	YU 6-7158
London W-1, England	Mayfair 3181
Celle, West Germany	Celle 3452
Piacenza, Italy	20-97
Mexico City, Mexico	46-01-56
Maracaibo, Venezuela	2109
Salvador, Bahia, Brazil	1116
Calgary, Alberta, Canada	AM 9-6141
Buenos Aires, Argentina	45-4944

HALLIBURTON

PRESSURE GROUTING SERVICE

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▲ **Calif., San Jose**—ENGINEERING—BA 6/21—State Div. Architecture, 1120 N St., Sacramento, 3 story, 169,000 sq. ft. rein.-con. engineering bldg., San Jose State College, WO 4160GC-38. $3,500,000. Plans deposit $150. Harold C. Guilkey, 109 Stevenson St., San Francisco, archt. CD 6/18.

HEAVY CONSTRUCTION—LB & CA

▲† **B-E-C-K, McLaughlin & Assocs., Robert & Kief** and **Morrison-Knudsen Co., Inc.**, 3647 Stone Way, Seattle 3, Wash., CA **$1,726,444**, Schedule B, communications facilities Shemya Air Force Station, Inv. 60-48, ALASKA. U. S. Eng., P.O. Box 7002, Anchorage, Alaska. Bids May 10. CD 5/12, under LB.

▲ **Tucci & Son and Woodworth & Co.**, 2815 S. Lawrence St., Tacoma, Wash., LB **$1,694,877**, est. $1,750,000, (9 bidders), 44 mi. interceptor, trunk, lateral and house sewers, WEST SLOPE, ORE. City Sanitary Dist., 3105 SW 89th Ave., West Slope, Ore. Bids May 11. CD 4/20.

† **Green Constr. Corp., & Tecon Corp.**, Securities Bldg., Seattle, Wash., CA **$1,191,912** (6 bidders), excavation, constr. powerhouse, Hills Creek Dam on Middle Fork Wiliiamette River, OREGON. U.S. Eng., 628 Pittock Block, Portland 5, Ore. Bids May 10. CD 5/18, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Guy F. Atkinson Co., P.O. Box 259, Long Beach, Calif., CA **$11,712,105**, 3 level interchange at jct. of Golden State and Glendale Freeways in Los Angeles and addnl. 3.7 mi. freeway mostly on Golden State Freeway, 20 bridges and ramp structures, VII-L.A. 161-162 LA, Los Angeles Co. Bids Mar. 31. CD 4/5, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,

L. C. Smith Co., 225 19th Ave., San Mateo, Calif., CA **$1,528,442**, grading, surf. to wid'n. Bayshore Freeway (U. S. 1011 by-pass) between 0.2 mi. north of Brand Ave. in South San Francisco and Peninsular Ave. overcrossing in San Mateo, 7.5 mi. IV-SM-68, SSF, F, MULBR, BURL, SM, San Mateo Co. Bids May 4. CD 5/6.

BUILDINGS—LB & CA

▲ **Lease Co. Inc.**, 1501 N. 35th St., Seattle 3, Wash., CA **$5,683,835**, MENTAL HOSPITAL, ANCHORAGE, ALASKA. State Dpt. P. Wks., Juneau, Alaska. Bids Apr. 27. CD 5/6, under LB.

▲† **Base Procurement Office**, Mountain Home Air Force Base, Idaho, cancelled bids to have been opened May 26, 820 units Capehart Housing, Mountain Home Air Force Base (No. 2), Inv. 60-49, MOUNTAIN HOME, IDAHO, **$13,000,000**. CD 5/10.

▲ **Campion Constr. Co.**, 202 Twenty-First St., Ogden, Utah, LB **$1,964,000**, est. $1,750,000, (11 bidders), 2 story SENIOR HIGH SCHOOL with separate SHOP BLDG., BRIGHAM CITY, UTAH. Box Elder County Bd. Educ., Brigham City, Utah. Bids Apr. 27. CD 4/5.

† **M.J.B. Constr. Co.**, 661 E. 32 St., Yuma, Ariz., LB **$352,879** (5 bidders), road and utilities at Drone Test Facility, ENG-04-353-60-85, FORT HUACHUCA, ARIZ. U.S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 3. CD 4/27.

H. S. Ferguson Co., 1927 1 Ave. S., Seattle, Wash., CA Est. **$400,000**, 120x330 ft., rein.-con. equipment FACTORY, with 36x46 ft. OFFICE, SEATTLE, WASH. Clough Equipment Co., 2739 6 Ave. S., Seattle, Wash. CD 5/17.

▲ **Rossmoor Builders, Inc.**, 3402 Rossmoor Way, Los Alamitos, Calif., Owner Builds, **$4,832,947**, 277 frame, stucco DWELLINGS, Los Alamitos area, LOS ALAMITOS, CALIF.

Bartelson Dev. No. 1, 504 Tolouse St., Riverside, Calif., Owner Builds, **$435,500**, 33 stucco DWELLINGS, Mary Lee Ranchos Sub Tract, BANNING, CALIF.

South Coast Constr. Co., 230 30th St., Newport Beach, Calif., CA **$160,000**, 270x630 ft. FACTORY, 1644 Whittier Ave., COSTA MESA, CALIF. Servon Instrument Co., Inc., 640 Terminal Way, Costa Mesa, Calif. W. Jordan, 771 W. 19th St., Costa Mesa, Calif., archt.

Harris Constr. Co., P.O. Box 109, Fresno, Calif., CA **$588,130**, frame, stucco ext. walls, concrete slabs, composition roof. Richard J. Neutra ELEMENTARY SCHOOL, LEMOORE, CALIF. Central Union Elementary School Dist., 15783 18th Ave., Lemoore, Calif. Bids Apr. 28. CD 5/6, under LB.

▲ **Fred S. Macomber Co.**, 8818 Melrose Ave., Los Angeles, Calif., CA **$2,162,000**, TUBERCULAR SEGREGATION and RECALCITRANT UNIT, Mira Loma Facility, Lancaster, LOS ANGELES, CALIF. Bd. Supervs., Los Angeles Co., 501 Hall of Records, Los Angeles, Calif. Bids Feb. 24, awarded Mar. 8. CD 2/26, under LB.

▲ **Bob Long Constr. Co.**, P.O. Box 1623, Fresno, Calif., CA **$1,521,050**, 279 room, 68,362 sq. ft. steel frame and masonry OUT-PATIENTS BLDG., San Joaquin General Hospital, French Camp, STOCKTON, CALIF. San Joaquin County, Courthouse, Stockton, Calif. Bids Mar. 28. CD 4/4, under LB.

Frank H. Ayres & Son, 633 S. Shatto Pl., Los Angeles. Calif., CA **$725,500**, 55 stucco DWELLINGS, Newport Shores, Tract 772, NEWPORT BEACH, CALIF. Newport Shores Co., 633 S. Shatto Pl., Los Angeles, Calif.

CANADA

HEAVY CONSTRUCTION—BA

▲† **Labrador, Goose Bay**—AIRFIELD FACILITIES (CY-60)—BA 6/9—U.S. Eng., 346 Broadway, New York 13, N. Y., airfield facilities, incl. A/C weapons calibration shelter, 1 story, steel frame, 6,300 sq. ft., concrete fdns., readiness crew addn. with concrete block bearing walls, three ramps, readiness hangar, etc. Goose Air Base, ENG-30-347-60-30. Over $1,000,000. CD 5/2.

BUILDINGS—BA

▲ **Ont., Brampton**—HOSPITAL—BA 6/7—Peel Memorial Hospital Bd., Brampton, hospital extensions, $1,500,000. Plans deposit $50. Govan, Ferguson, Lindsay, Kaminker, Langley & Keenleyside, 10 Price St., Toronto, archts. CD 3/7/56.

HEAVY CONSTRUCTION—LB & CA

Terminal Constr. Co. Ltd., 4920 Western Ave., Montreal, Que., and **Tallman Constr. Co. Ltd.**, 600 Panet Rd., Winnipeg, Man., LB **$399,619**, aircraft parking apron, entrance roads and car parking area at International Airport, EDMONTON, ALTA. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids May 12. CD 5/4.

▲ **Poole-Pritchard Canada Ltd.**, 2402 2A St. SE, Calgary, Alta., CA Est. **$1,000,000**, compressor station for natural gas pipe line, Portage LaPrairie, MANITOBA, Trans-Canada Pipe Lines, Ltd., 150 Eglinton Ave. E, Toronto, Ont., Bids Apr. 20, CD 4/11;
Catalytic Constr. Co. of Canada Ltd., 149 N. Victoria St., Sarnia, Ont., CA Est. **$1,000,000**, compressor station for natural gas pipe line, Rapid City (Manitoba).

▲ **Montreal Engineering Co.**, P. O. Box 250, Place d'Armes, Montreal, Que., CA Est. **$1,000,000**, compressor station for natural gas pipe line, Ramore, ONTARIO. Trans-Canada Pipe Lines Ltd., 150 Eglinton Ave. S., Toronto, Ont. CD 4/8.

▲ **Marwell Constr. Co., Ltd.**, 1500 W. Georgia St., Vancouver, B. C., CA Est. **$1,000,000**, compressor station for natural gas pipe line, Cabri, SASKATCHEWAN. Trans-Canada Pipe Lines, Inc., 150 Eglinton Ave. E., Toronto, Ont., Bids Apr. 20, Grand total est. $4,000,000. CD 4/12;
Canadian Kellogg Co. Ltd., 33 Bloor St. E., Toronto, Ont., CA Est. **$1,000,000**, compressor station for natural gas pipe line Grenfell (Saskatchewan);
Brown & Root Ltd., 332-7th Ave. SW, Calgary, Alta. and Hy. 14, Edmonton, Alta., CA Est. **$1,000,000**, compressor station for natural gas pipe line, Herbert (Saskatchewan);
Perini Corp., 49 Jackes Ave., Toronto, Ont., CA Est. **$1,000,000**, compressor station for natural gas pipe line, Regina (Saskatchewan).

BUILDINGS—LB & CA

▲ **Lubecker Maschinenbaug**, Lubeck, Germany, and **M. W. Kellogg Co. Ltd.**, Calgary, Alta. and 711 3rd Ave., New York, N. Y. U. S. A., CA PLANT to extract oil from tar sands, incl. dehydration, coking, and desulfurization, near Athabasca, ALBERTA, Great Canadian Oil Sands Ltd., 508 8th Ave. W., Calgary, Alta. Total est. **$99,355,035**;
Mannix Co. Ltd., 737 8th Ave. S. W. Calgary, Alta., CA, 16 in. pipe line from plant to Inter-provincial Tank Farm, Calgary, bridge and road (Alberta);
Link Belt Ltd., 1960 Eglinton St. E., Scarborough, Toronto, Ont., CA, mining and conveying systems (Alberta).

▲ **Foundation Co. of Canada Ltd.**, 902 11th Ave. SW, Calgary, Alta., CA **$2,369,247**, HIGH SCHOOL, Elbow Dr. and 5th Ave. S. W., CALGARY, ALTA. Calgary Public School Bd., 4th Ave. and 6th St. W., Calgary, Alta. Bids Apr. 28, awarded May 11. CD 4/11.

▲ **Modern Constr. Co. Ltd.**, Box 669, Moncton, N. B., CA Est. **$2,500,000**, 2 story, rein.-con., steel SCHOOL FOR THE DEAF, AMHERST, N. S. N. S. Dpt. P. Wks., Parliament Bldgs., Halifax, N. S. Bids Mar. 17. CD 3/9.

▲ **Bird Constr. Co. Ltd.**, Box 388, Port Arthur, Ont., CA **$2,550,777**, three wings inter connected 3 story, 62 x 233 ft. centre wing, two 2 story, 34 x 52 ft. wings HOSPITAL, PORT ARTHUR, ONT. Dpt. P. Wks., Rm. 6630, East Block, Parliament Bldgs., Toronto, Ont. Bids Mar. 30, awarded May 9. CD 4/16, under LB.

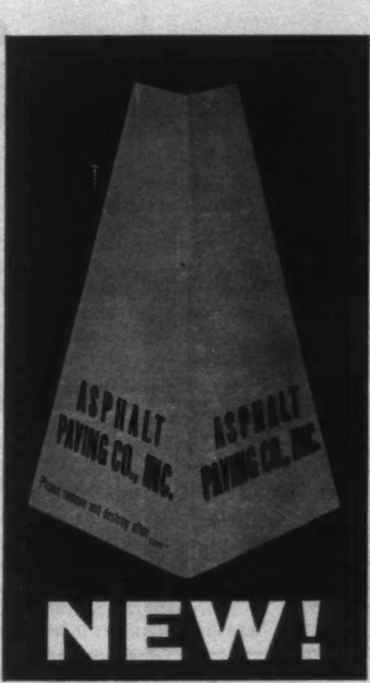
▲ **Magil Constr. Ltd.**, 410 Gratton St., St. Laurent, Que., LB **$1,700,000**, 2 story, rein.-con., brick, PLANT and OFFICES, Hodge St., MONTREAL, QUE. H. Simon & Sons Ltd., 151 Rockland Rd., Mount Royal, Montreal, Que. Bids Apr. 8. CD 3/25.

▲ **Montclair Constr. Co.**, 5515 Upper Lachine Rd., Montreal, Que., CA **$1,500,000**, (7 bidders), PLANT expansion, MONTREAL, QUE. Gattuso Corp., 5205 Cote de Liesse Rd., Montreal, Que. Bids June 22. CD 6/22.

PUERTO RICO

HEAVY CONSTRUCTION—LB & CA

▲ **PUERTO RICO**—P. Wks. Dpt., Stop 23, San Juan, **Vicente Valdivieso, Inc.**, Box 13335, Cayey, Puerto Rico, LB **$2,326,905**, 13.402 km. highway leveling and drainage, San German-Hormigueros, Proj. F-2-5(4).



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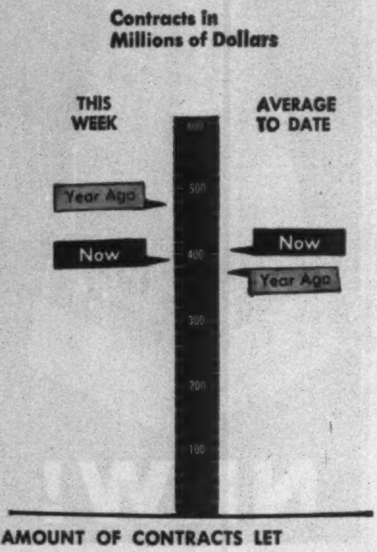
Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

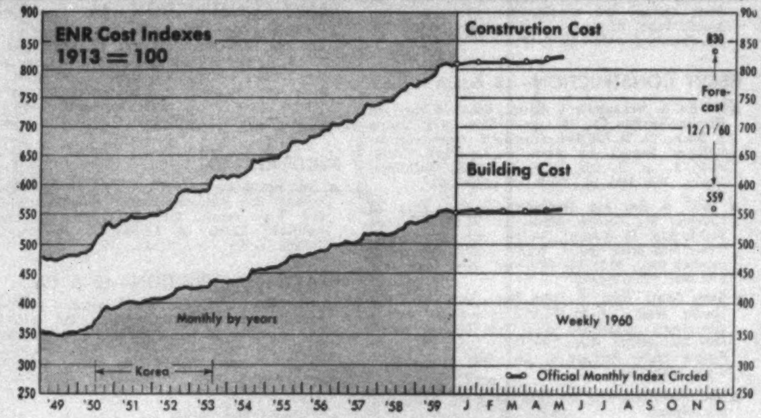
Contracts Awarded In 50 States By Type	This Week (millions)	Cum. 21 wks 1960 (millions)	Chge '59-'60 %
All Heavy Construction	$389.1	$8,477.3	+ 8
By Ownership			
PRIVATE	173.2	4,529.3	+19
PUBLIC	215.9	3,948.0	− 2
State & Municipal	175.9	3,037.5	+ 5
Federal	40.0	910.5	−21
By Type of Work			
PUBLIC			
Waterworks	4.7	182.4	− 2
Sewerage	8.8	213.3	−15
Bridges*	6.9	353.3	+51
Highways	107.1	1,253.2	+ 7
Earthworks, Dams & Waterways	22.8	288.3	− 9
Buildings:			
Excl. Housing	43.3	930.7	− 8
Housing	1.1	203.9	−22
Unclassified	21.2	524.3	−14
PRIVATE			
Buildings:			
Mass Housing	92.7	2,257.4	+38
Commercial	43.3	858.1	− 7
Industrial	23.2	1,023.3	− 6
Unclassified	14.0	389.1	+143

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of May 19 (millions)	Cum. 20 wks 1960 (millions)	Chge '59-'60 %
Corporate Securities	$ 43.2	$1,070.2	−24
State and Municipal:			
All Except Housing	98.9	2,634.6	+ 1
Housing	....	13.6	−56
Federal Loans	3.5	66.3	+16
Federal Aid	....	2,717.8	....
Total Nonfederal	$145.6	$6,502.5	+58
Federal Appropriations:			
Projects in U. S.	....	168.1	....
Outside U. S.	....	6.8	....
Total New Capital	$145.6	$6,677.4	+62



ENR INDEXES (1913=100), 20-cities' average	Week of May 19 1960	% Change from Apr 21 1960	% Change from May 21 1959
Construction Cost	823.80	+1.11	+3.64
Building Cost	558.91	+0.43	+2.03

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

Latest Month . . .

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	April 1960 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (50 states)	$122,174	−0.2	+ 8.4
By Ownership—			
Private	54,243	−0.01	+14.0
State & Municipal	53,653	−0.1	+ 4.7
Federal	14,278	−0.9	+ 3.0
By Type of Work—			
Waterworks	2,893	+0.5	+19.8
Sewerage	3,888	+0.2	+14.0
Bridges	3,323	−1.9	− 3.6
Highways	13,831	−0.1	+ 2.6
Earthwork, Dams and Waterways	11,971	−0.3	− 2.4
Public Buildings	22,146	+0.1	+10.0
Industrial Buildings	17,361	−0.7	+ 4.1
Commercial Buildings	26,259	+0.5	+24.9
Unclassified, Private	10,622*	0	− 7.6
Unclassified, Public	9,879	−1.1	− 0.6

* Includes Private Bridges, $95 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1960 Apr. (millions)	1960 4-months (millions)	Percent Change† from 1959 Apr.	Percent Change† from 1959 4-Mos.
Total U. S. (50 states)	$1,410	$8,824	−25.3	+19.4
By Ownership—				
Private	850	4,914	−17.0	+34.1
State & Municipal	523	3,448	−10.6	+25.2
Federal	37	462	−86.7	−18.0
By Type of Work—				
Waterworks	37	133	+53.5	−20.8
Sewerage	54	229	+12.6	+ 3.9
Bridges	5	95	−77.1	−50.3
Highways	110	1,283	−43.4	+59.0
Earthwork, Dams and Waterways	9	63	−50.0	−30.3
Public Buildings	317	1,708	−32.0	+19.0
Industrial Buildings	217	1,124	+ 1.3	+ 2.1
Commercial: Mass Housing	350	2,510	−35.6	+98.0
Other Building	235	1,055	+14.0	+16.4
Unclassified, Private	48	225	−20.5	−41.9
Unclassified, Public	29	398	−68.8	− 1.4

FLOW OF PROJECTS OUT OF BACKLOG INTO CONTRACTS

	1960 Apr. (millions)	1960 4-months (millions)	Percent Change† from 1959 Apr.	Percent Change† from 1959 4-Mos.
Total U. S. (50 states)	$862	$3,206	+ 6.3	− 1.2
By Ownership—				
Private	339	1,267	+37.0	+12.8
State & Municipal	407	1,388	+17.6	− 0.1
Federal	117	551	−46.5	−24.8

† Based on average week: 4 weeks in Apr. '60, 5 weeks in Apr. '59; 17 weeks in first four months of 1960, 18 weeks in first four months of 1959.

Business and Finance

New Rules for U. S. Surplus Sales?

- **Dawson bill would lift prohibition on sales of surplus building equipment from overseas.**
- **CIMA spokesman claims "mass importation will add to the deterioration of the industry."**

Hundreds of millions of dollars worth of construction equipment used by U. S. agencies abroad and declared surplus could be put on the market here if Congress passes an Administration-backed bill authorizing these imports.

The House of Representatives' Government Operations Committee last Friday approved a bill, HR 9996, that would permit domestic disposal of foreign-generated surplus property unless the Secretary of Commerce decides its importation would be harmful to the country's economy.

Under existing law the situation is just the reverse. Section 402 of the Federal Property and Administrative Services Act of 1949 prohibits importation and domestic sale of surplus property from abroad unless the Secretary of Commerce decides that it would "relieve a domestic shortage or otherwise be beneficial to the economy of the country."

In other words, under HR 9996, proposed by Rep. William Dawson (D., Ill.), the Secretary of Commerce would have to take action to keep the construction equipment and other items out. As it stands now, he has to act to let any of it in.

There's little chance the bill will be passed this session. It's now in the Rules Committee, which may not let it onto the floor for vote. There is increasing protectionist sentiment in Congress these days. Also, there are more important pieces of legislation to be handled yet this session. If the Dawson bill isn't passed before the end of the session, it will die and have to be reintroduced for passage.

The Department of Commerce helped Representative Dawson write his bill. Administration support of the measure marks a switch in policy. Officials now believe changes are desirable to bring foreign property disposals into line with the wide excess-property disposals of domestic stockpiles.

Other backers of the Dawson bill are the National Association of Foreign Excess Property Importers and the Machinery Dealers National Association.

The legislation has stiff opposition from business groups, particularly the Construction Industry Manufacturers Association. CIMA claims that any broadening of the surplus import laws would harm the industry. The group has long fought to keep heavy construction equipment—from the Spanish and North African bases, for instance—from being brought back to the U. S. for sale.

Sold at public auction, this construction equipment can go at 50% to as low as 95% below the original purchase price. Heavy equipment, such as 50-ton cranes, aren't likely to sell at the 95% discount, but small units, such as compressors, portable power plants and pumps, could go that cheaply, dealers say.

During fiscal year 1959 only $6 million worth of government-owned surplus goods came into the U. S. from abroad. This amount is less than 0.5% of the $1.4 billion in goods declared excess overseas that year. Most of the surplus was bought by foreign businessmen.

The Department of Commerce officials make no estimate of just how much additional foreign excess property could be brought in under the Dawson bill, but they say it would be significantly greater than $6 million worth imported in 1959.

There are no definite reports on the value of surplus construction equipment abroad. Industry officials estimate that as much as $400 million worth of heavy building machinery would become available under the Dawson bill.

Robert McKenrick, executive vice president of CIMA, told a subcommittee of the House Committee on Government Operations in March: "Enactment of HR 9996 would destroy the protection that is now afforded this industry and would not only permit, but also would encourage, the mass importation of foreign-generated government surplus equipment, adding to the further deterioration of an industry that is already operating at slightly over 50% capacity."

The Department of Commerce established the capacity of the construction equipment manufacturers at $3 billion annually. Department statistics show 1959 sales were $1.8 billion and 1958 sales were $1.9 billion.

"There is not now and never has been a domestic shortage of construction machinery in this country under peacetime conditions," said Mr. McKenrick.

"The recent steel strike did not generate a shortage of construction machinery and equipment. Any layoffs at the factories or any reduction in production activity was not from a shortage of steel, but was entirely due to the large finished inventories that had been built up by the manufacturers and their retail distributing organizations in excess of the end users' requirements."

Other spokesmen for the industry say the Dawson bill would flood the construction equipment market if it were passed. Some go even farther and say that the 1949 law does not provide adequate protection. By some means, they say, surplus equipment from abroad comes into the U. S. and is sold. They want stronger enforcement of the existing law.

Commerce Department officials don't agree that passage of the Dawson bill would result in a flooded market. They reason that the department would still make the final determination of what could be brought in and it would give ample consideration to domestic interests.

Commerce feels that foreign businessmen would continue to pick up a substantial amount of excess disposals, though somewhat less than the 90% they have taken in recent years.

The amount of surplus to be disposed of is declining, these officials say. In fiscal '59, $1.4 billion worth was declared excess. That amount will drop to $400 million and possibly less in fiscal 1960. The large disposals of recent years reflect a working off of Korean War stocks.

During World War II, 90% of the domestic production of construction machinery was scheduled for military use.

During the Korean War, 55% of the entire domestic output was diverted from the end user to military channels.

The imports of the past few years have been limited, for the most part, to a few specific items. One-quarter of the disposals during fiscal 1959 went for scrap. The bulk of the other imports of surplus were automobile and aircraft parts, tires, metals and some machinery.

UNION

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In the Union research laboratory and in those of the steel producing organization in which Union is integrated, technicians are hard at work on many new projects. They were started and will be finalized in the field where Union engineers spend more time than in the laboratory.

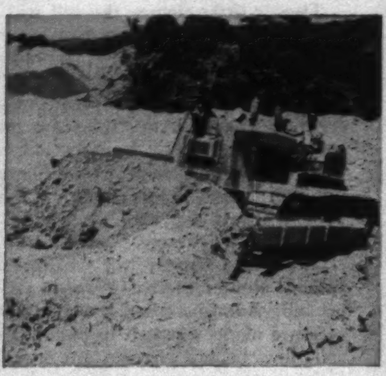
Classic example of what results from such deep and constant probing is the Tuffy family of wire ropes and slings, each one of them engineered to a specific job. Among 1600 standard wire rope constructions, in day to day production, none could be classified as the ultimate low cost wire rope for bulldozers, draglines, scrapers or hoisting equipment. One by one new metallurgical specifications and rope and sling constructions were tailored to meet the different but tough operating conditions inherent in the jobs these machines perform.

Tens of thousands of applications have established the unchallenged supremacy of Tuffy special purpose wire ropes and slings.

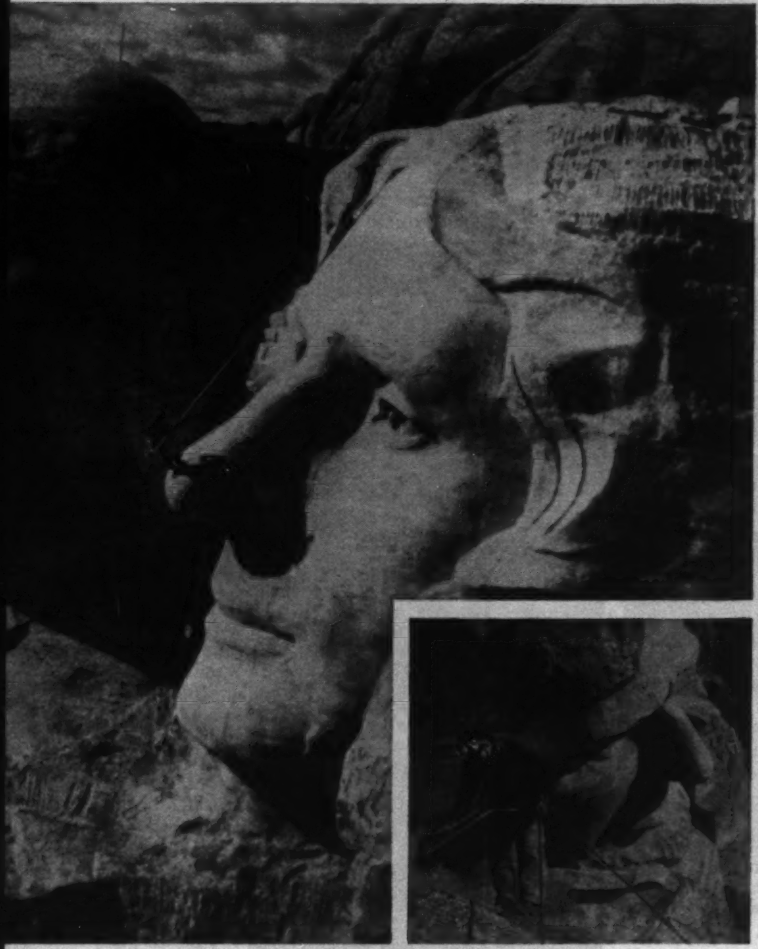
Tuffy Wire Ropes and Slings are "Job Prescribed" for Tough Jobs

Tuffy Balanced Dragline Rope

Tuffy Balanced Scraper Rope



Tuffy Balanced Dozer Rope



At Mount Rushmore National Memorial in South Dakota small fissures in the sculptured faces of Washington, Jefferson, Lincoln and Roosevelt are being sealed with granite dust and white lead. Though the granite sculpture is estimated to last for thousands of years, this preventive maintenance will keep the surfaces smooth and slow the natural erosion process. The insert shows how workmen are suspended on Union Wire Rope.

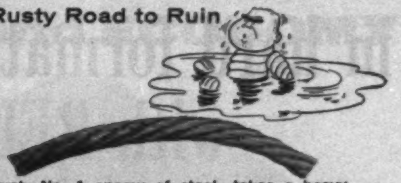
For "Live Wire" Service— Look Up Your Union Distributor in the Yellow Pages

When you get him on the wire, you're sure to get the best in wire rope and slings—plus service that helps you get from Union Wire Rope products all the quality and long life Union builds into them. Union Wire Rope Corporation, 2228 Manchester Avenue, Kansas City, 26, Missouri.

Tuffy Wire Rope Tips

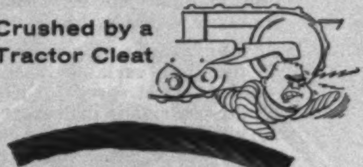
Guard Against These Killers!...Get the Full Measure of Service-Life Built In By Wire Rope Specialists.

Rusty Road to Ruin



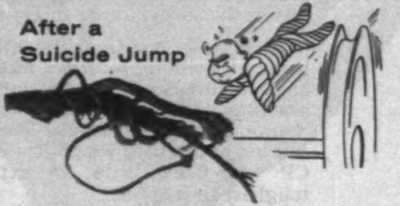
Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. The one-strand break shown here resulted when the rope was allowed to become rust-bound through lack of lubrication. Tests show that properly lubricated rope has up to 10 times the life expectancy of dry rope.

Crushed by a Tractor Cleat



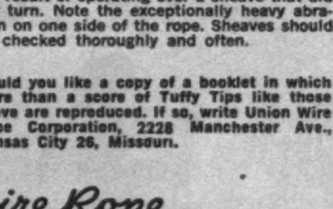
The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mistreatment.

After a Suicide Jump



This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

Burned on a Frozen Sheave



End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, 2228 Manchester Ave., Kansas City 26, Missouri.

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. . . instant safety torque release protects all drive components.

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T-650 truck-mounted REICHdrill in operation on construction work. Hole size: to 7⅞"; downpressure: 30,000 pounds. Other models available, truck or crawler mounted, with hole size to 16 inches, down pressure to 90,000 pounds.

California Is Set to Vote On $700-Million in Bonds

Bond proposals totaling $700 million will be on the ballots when California holds its primary election on June 7. Of the total, $300 million would go for school construction. Veterans' farm and home loans claim the remainder.

The school bonds would provide funds for lending to local school districts.

In Fresno, voters will also act on $17.5 million of local bond proposals. Earmarked for seven new schools is $9.5 million worth of bonds. Another $6 million would pay for replacement of and additions to existing schools. The remaining $2 million would cover cost of site acquisition and equipment.

Construction to Start On $30-Million Terminal

The San Francisco Port Authority last week authorized the sale of $15 million worth state harbor bonds to finance a construction-start on a $30-million port terminal. It will be constructed on a 60-acre site.

Construction may start by early fall, although no details on bid calls have been announced.

The terminal will consist of finger piers and have berthing capacity for eight or nine cargo ships. Preliminary plans call for lifting installations to handle container cargo and trailerships.

The bonds scheduled for sale are part of a $50-million issue approved by voters in 1958. Last fall, the authority sold $7.5 million worth of bonds to retire $5.6 million worth of outstanding issues.

Tire Firm Plans to Spend $120 Million for Plants

Firestone Tire & Rubber Co., Akron, is spending $120 million for construction and modernization of production facilities in this country and abroad.

Harvey S. Firestone, Jr., chairman and chief executive officer, says the money has already been appropriated.

Included in company plans are five new plants. Tire manufacturing facilities are under way in Calgary, Alberta, Can. and Bethume, France.

Synthetic rubber plants will be constructed in Port Jerome, France, and Bareilly, India. A new plant will be completed this year in Orange, Tex.

Expansion and modernization programs are under way at all of the company's installations in North America. Included are plants at Akron, Memphis, Des Moines, Los Angeles, and Pottstown, Pa.

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Bargaining Stiff, Wages Rise

- **Construction union hourly wages are up to $3.55; that's 14.7 cents higher than in April, '59.**
- **But there is some evidence that the rate of increase is slowing slightly.**

Union construction workers pushed their hourly wage scales up by 14.7 cents during the last four calendar quarters, giving them an average wage scale of $3.55 an hour on April 1.

In its first quarter report on construction wages, the U.S. Labor Department's Bureau of Labor Statistics said the increase averaged 4.4% above the April 1959 level and 72% above the 1947-49 average. The bureau's figure for the calendar year 1959 was 4.7%.

Although the report indicates the systematic continuation of a long-established trend, there may be some consolation in the BLS observation that **the 1960-first quarter rise was only about half of those registered in the first quarters of the past two years.**

This in itself may not mean much for several reasons: The BLS figures include adjustments caused by automatic, deferred wage increases under existing long-term labor contracts as well as newly negotiated increases; they are based on only seven trades in 100 cities; and the end of the first quarter is not a significant date in collective bargaining because the bulk of settlements occur in the late spring and early summer.

While it is too early to tell how 1960 will shape up, there may be some supporting evidence that the annual rate of construction wage increases is slowing down.

The average of the increases granted for 1960 in 35 new settlements recently reported to ENR, for 14 different trades in 19 areas, for example, is a little over 12 cents—or about two cents under last year's average. The settlements were achieved in comparatively stiff bargaining marked by protracted negotiations and some strikes.

This group of settlements conforms in other respects, however, to the old patterns:

- Increases effective in 1960 range from a low of 4½ cents an hour to a high of 20 cents. Twenty-four of the contracts grant wage hikes of 10 cents or more; 11 of them call for increases of 15 cents or more.
- Five of the contracts pay the 1960 increase in two installments.
- Eight settlements provide for improvements in fringe benefits. Health and welfare and pensions evoked the most interest.
- More than two-thirds (24) of the contracts are for two years. Six are for one year, three for three years, and two for four years.

Bargaining issues, in addition to wages and fringe benefits, included hiring hall provisions, union and agency shop clauses, travel pay, moonlighting, overtime pay, apprenticeship contributions, show-up pay and clauses that impose the contract terms on subcontractors.

Neither the "Ten Commandments" nor the Landrum-Griffin labor law appear to have had much of an impact on bargaining results. One notable exception was negotiation of a specific ban against coffee breaks and reduction in travel pay for 6,800 plumbers in the Chicago area. The new labor law has led to some less-than-30-days union shop clauses, but the interest it has generated in subcontractor clauses seems to have made little headway except in the generation of friction and strikes.

Among the new contracts in this group of 35 are these:

- Chicago plumbers took a two-year contract for a 10-cent increase in wages this year and 15 cents next year. They also get a six-cent addition to the welfare contribution. Payment of carfare and travel expenses has been halted except in two work areas. Time off for coffee breaks is specifically prohibited.
- Rhode Island teamsters employed by members of the Associated General Contractors agreed to a four-year contract calling for annual wage increases of 5, 12, 10 and 10 cents. The contract calls for establishment this year of a health and welfare fund to which employers will contribute eight cents an hour.
- Laborers in Rochester, N. Y., have accepted a 32-cent package (14½ cents in wages and 17½ cents in fringes) in a two-year contract. Wages will be increased 4½ cents this year and 10 cents next year. Effective this year, employer contributions for hospitalization will be increased 2½ cents and a 10-cent employer contribution to a new pension plan will commence. Next year the pension contribution will go to 15 cents.
- A new three-year agreement between teamsters and the Minnesota AGC gives annual increases of 15, 13 and 12 cents. The contract contains an eight-day union shop clause.
- Carpenters in Muncie, Ind., settled for 25 cents in wages and 10 cents in fringe benefits in a two-year contract. They get an immediate pay boost of 10 cents, a new 7½-cent health and welfare plan, 2½ cents more in wages October 1, 1960 and another 15-cent wage increase next May 1. An agency shop clause, getting around the state's right-to-work-law, will require nonunion workers to pay the union a sum of money equal to initiation fees, dues and assessments paid by union members.
- Iron workers (reinforcing) in Dayton, Ohio, settled for a two-year contract calling for annual increases of 20 and 15 cents, each payable in two installments.

Strikes have occurred or are still in progress in a number of areas. Recent trouble spots have included Tampa, Fla.; Baltimore, Md.; Rochester, N. Y.; Providence, R. I.; Scranton, Pa.; Eastern Indiana; Des Moines, Iowa; St. Louis, Mo.; Memphis, Tenn.; Albuquerque, N. M. and San Diego, Calif.

Labor Attacks Practices That Nullify Pay Boosts

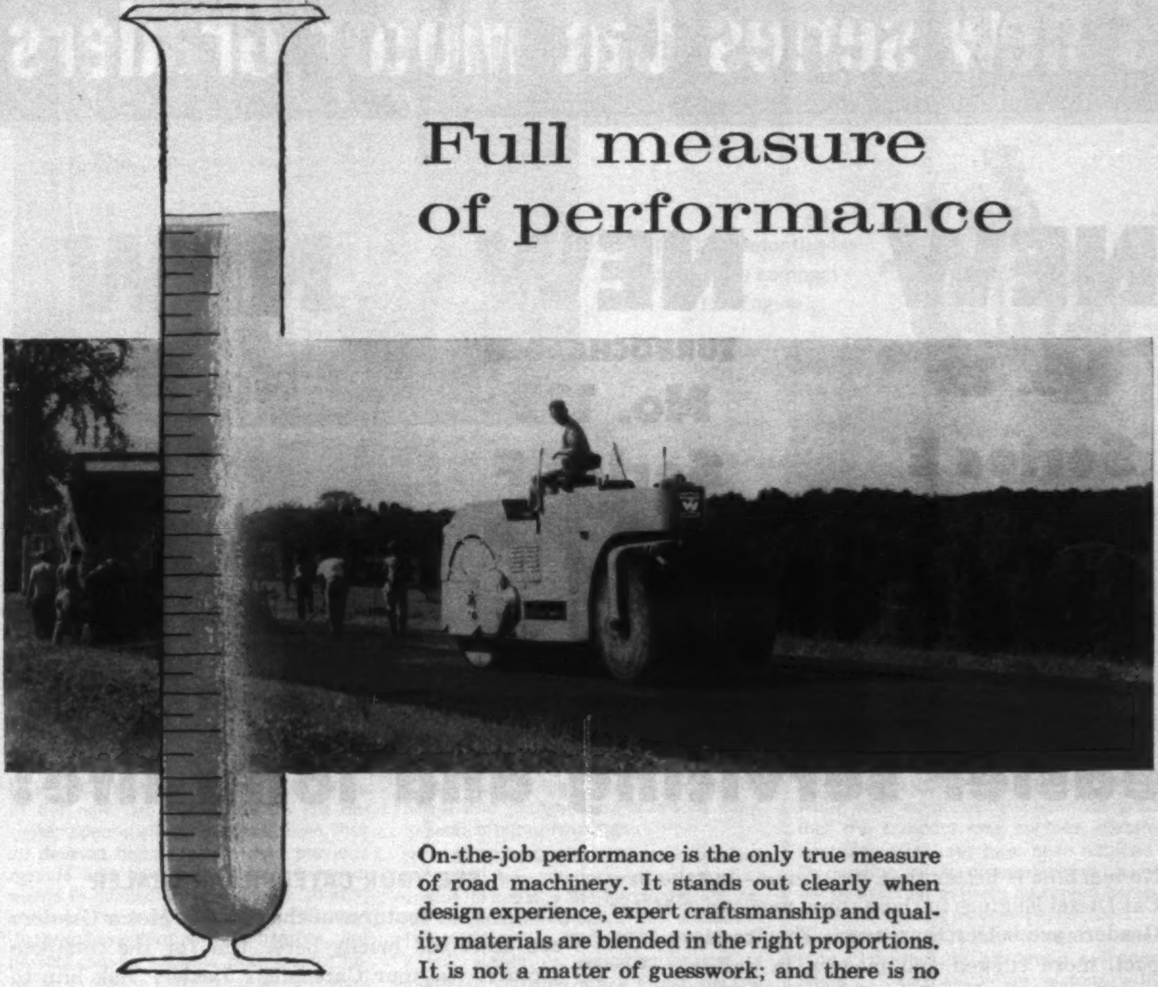
The AFL-CIO has developed another educational program to increase its finesse in collective bargaining.

Working with the University of Wisconsin School for Workers, it has set up four training courses designed to help union staff members at the international and local levels deal with time study, wage incentive and job evaluation problems.

An AFL-CIO spokesman claims that management has been able to nullify wage increases "by downgrading jobs, increasing work loads and lowering incentive earnings." He said the new program should put union staff members in a better position to deal effectively with such "abuses."

The training will be given in four industrial engineering institutes to be held in June at the University of Wisconsin.

Full measure of performance



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The new Turbocharged 100 HP No. 112F is designed for high production to match work requirements between the new 85 HP No. 112E and new 115 HP No. 12E. Compared with the 85 HP model, the 100 HP machine delivers 5% higher travel speeds and a 5% increase in blade speed control. With its introduction into the line, Caterpillar now offers you a choice of four Motor Graders in all to meet your specific requirements. The largest is the Turbocharged 150 HP No. 14, the most versatile big grader ever developed.

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Some of the features of the new Cat Motor Graders are described briefly here. But for the complete picture, see your Caterpillar Dealer. Ask him to show you how they're a better buy for your money than ever. Take a look under the hoods at the new modern-design engines. Better still, ask for a demonstration.

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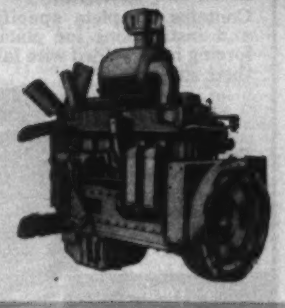
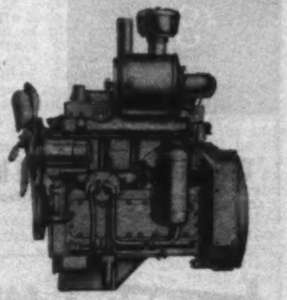


New No. 12E Motor Grader
features new compact
115 HP Engine



New No. 112E Motor Grader
features new compact
85 HP Engine

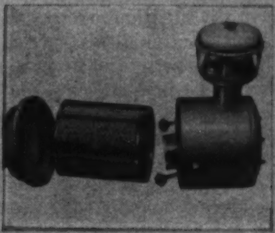
The new No. 112F is similar in appearance, but features a Turbocharged 100 HP Engine.

NEW HIGH TORQUE. Though the engines in the new Cat Motor Graders are designed specifically for each machine, they all develop higher torque than previous models and have other basic improvements in common. For example: shorter, stiffer blocks and crankshafts . . . stronger, distortion-resistant cylinder heads . . . improved cooling systems with greater capacity . . . engine lubricating oil conditioning . . . and advanced design fuel systems —new, compact fuel injection pumps with barrel and plunger assemblies in easy-to-service pump housings.

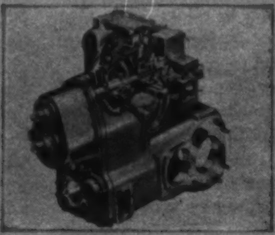
NEW STARTING ENGINE. Now standard is a new two-cylinder, vertical starting engine to replace the horizontal engine. All three Motor Graders use a modern 12-volt electric system. An optional 24-volt system is available for use in moderate climates where direct electric starting is practical.

PERFORMANCE-PROVED FEATURES. While many advances have been designed into the compact new engines, certain time-tested features have been retained. To mention a few: precombustion chamber design that delivers maximum horsepower on heavy, economy-type fuels . . . steel-back aluminum bearings . . . wet-type "Hi-Electro" hardened cylinder liners . . . and aluminum pistons with cast-in ring band.

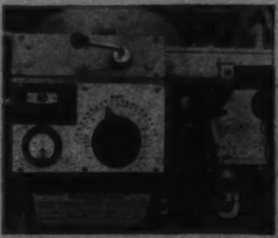
OTHER HIGH-PRODUCTION FEATURES IN CAT MOTOR GRADERS



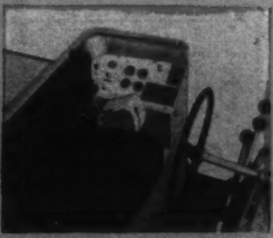
NEW DRY-TYPE AIR CLEANER (standard) removes a minimum of 99.8% of all dirt from intake air during every service hour. Can be serviced in 5 minutes. Cuts your maintenance time by as much as 70% and substantially reduces maintenance costs. Cleaner air also extends engine life.



EXCLUSIVE OIL CLUTCH (standard) provides up to 2000 hours service without adjustment, the equivalent of about 12 months of "adjustment-free" operation. A Caterpillar development proved by millions of hours of use, it virtually eliminates down time for clutch repair.



AUTOMATIC BLADE CONTROL (optional) cuts grading time in half. Operator sets desired slope on dial and only has to control depth of cut. Manufactured by Preco Incorporated, the unit automatically maintains blade slope within ⅛" in 10'. Available factory installed.



IN-SEAT STARTING (standard) offers operator finger-tip convenience and positive starts in any weather. Another feature: improved mechanical blade controls provide precise adjustment and ease of engagement. "Anti-creep" lock makes blade stay put under load.

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ESA Union Loses an Election

An affiliate of Engineers and Scientists of America has lost its representation rights at Western Electric Co., Inc.

The National Labor Relations Board, after conducting the largest representation election it has ever held among professional workers, reported that Western Electric engineers voted 3,970 to 2,630 against the union.

Initial reaction of labor leaders was that the election results are a blow to union drives to organize and represent professional and technical workers.

The vote was a rejection of the Council of Western Electric Professional Employees, which has had representation rights at Western Electric.

The union had asked for the NLRB election in an effort to remove technical workers from the scope of its bargaining responsibility for purely professional employees. It now contends that the election was held on a broader base than it should have been and that nonprofessionals were allowed to vote. The union, like all ESA affiliates, seeks to represent professional workers exclusively.

The issue of what represents an appropriate unit was the subject of involved and lengthy NLRB proceedings before the election was held.

The labor board held that the controlling factor in determining whether individuals are professionals is the character of the work performed rather than individual qualifications. Particular emphasis had been placed by the union on formal engineering education or equivalent experience.

About 6,750 "engineers" were declared eligible to vote. The balloting was conducted in 51 plant locations in 14 states and at 20 island and overseas locations.

Negroes Rejected for D.C. Job

A biracial group of experts has turned down five Negroes seeking to be the first members of their race hired for work as electricians in the nation's capital.

The experts, including three Negroes, told the General Services Administration that the Negroes did not possess adequate technical qualifications necessary for work on two construction projects in the District of Columbia.

The rejection of the Negroes represented a setback for the President's Committee on Government Contracts, which had tried to get Negroes hired for work on the projects—Federal Office Building No. 6 and the Smithsonian Institution (ENR May 12, p. 118).

The committee accused Local 26 of the International Brotherhood of Electrical Workers of discriminating against Negroes and failing to allow them into the local. Contractors for the work hire from the union by referral.

The committee then recommended that GSA study the matter further and screen the applications of the five Negroes who were recommended by the Washington Urban League.

GSA set up a panel of four persons, one a Negro, from GSA and another panel composed of six outside electrical contractors and engineers to review the applications. In addition, opinions were solicited from four other electrical engineers, two of whom were Negroes.

Without exception, the experts agreed that the Negro applicants were not qualified technically. In general, it was felt that the big difficulty facing Negroes seeking work in heavy electrical construction projects is the lack of any training school for them in the city. The only training school for apprentice electricians is maintained by the all-white Local 26.

Top officials of the IBEW washed their hands of the GSA investigation and refused to review the applications on grounds it was a local matter.

"We feel that the investigation has been both thorough and objective," wrote GSA Administrator Franklin Floete in a letter informing the President's committee of the rejection of the five applicants. The committee, headed by Vice President Nixon, did not question the findings.

Though handed a major setback, the Nixon group is not giving up in its efforts in the situation, which has taken on political overtones this election year.

"There is a pattern of discrimination that has to be broken," says one committee official.

The committee feels it has three choices:

- To try to have the National Urban League recruit qualified Negroes.
- To get GSA to ascertain whether white electricians are being hired for the job whose qualifications are less than those of the five Negro applicants who were rejected.
- To get AFL-CIO chief George Meany to supply qualified Negroes as he promised if none were hired for the job.

Labor in Brief . . .

- **Not a one-way street**—The U. S. Department of Labor has been accused of allowing corporations to reduce the Landrum-Griffin Act "to a nullity" through failure to comply with the management reporting provisions of the law. Walter Reuther, AFL-CIO vice president, has called on Labor Secretary James Mitchell to issue the necessary forms and enforce the law.

- **Right-to-work**—Voters in Mississippi will go to the polls June 7 to decide whether to accept or reject a proposal that the state's right-to-work law banning the union shop be inserted in the state constitution.

- **Another "alphabet" movement**—The teamsters union has begun its first national effort toward voter education with the formation of DRIVE—its Democratic, Republican, Independent Voter Education program. Joint Councils have the prime responsibility for carrying out the "grass roots" program of political and legislative action to make labor's influence felt at all levels of government.

- **Work hindered**—A labor dispute with a local of the teamsters union has hindered work on the $7.5-million Boston Common underground garage and on the second tunnel to East Boston, Mass. In litigation before the National Labor Relations Board and a federal court, the union is charged with secondary boycott activity to organize a trucking concern working on the projects.

- **Curb contributions?**—Sen. Barry Goldwater (R., Ariz.) has proposed that Congress curb the political power of labor unions by forbidding anyone but individuals to make political contributions. He said use of union dues to support candidates "seriously compromises American freedom."

- **Equipment operators**—The Weiser, Idaho, Western School of Heavy Equipment Operation, celebrating its third anniversary this month, has turned out a total of 900 graduates. The school is owned and operated by members of the Idaho and Oregon chapters of Associated General Contractors.

Prevailing Wage Bill Vetoed

An interesting twist in the controversial issue of prevailing wages has been rejected by Rhode Island's Gov. Christopher Del Sesto (R.).

The governor vetoed a bill that would have required contractors working on public projects to pay wages and fringe benefits equal to those received by union workers under collective bargaining agreements.

Existing state law does require the payment of prevailing wages. But these are wages determined by the state Department of Labor to be the rates received by a majority of workers, union and nonunion, employed in specific occupations.

In vetoing the bill, the governor said the measure would "delegate to representatives of organized labor and certain employers the power to determine the prevailing rate of wages in a trade, craft or occupation, whether or not the employees covered in collective bargaining agreements represent a majority of all workers in a specific trade, craft or occupation."

Result, the governor continued, could well be "that the wages paid to a small minority of workers in a trade, craft or occupation would in effect set the pattern for all workers in a trade, craft or occupation.

He remarked that sponsors of the bill apparently misunderstood the intent of the existing law, which, he said, is designed to prevent the payment of substandard wages.

The central issue of what are "prevailing" wages is not new to members of the construction industry. The federal Davis-Bacon provisions are similar to the existing Rhode Island one. They require the Secretary of Labor to take into account the wages paid to all workers in an area, whether union or nonunion.

Critics of the federal procedure, however, frequently contend that the secretary is guided by union rates.

Governor Del Sesto also expressed the opinion that the proposed state law might raise construction costs through the substitution of qualifying subcontractors after the awarding of contracts. He observed, too, that it might prejudice the state's right to federal aid on various projects. He offered a letter from U. S. Commissioner of Public Roads Ellis L. Armstrong supporting this.

OFFICIAL PROPOSALS

Bids: June 21, 1960

Cannonsville Dam
Contract 465

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Daylight Saving Time (10:00 A.M., Eastern Standard Time), on Tuesday, June 21, 1960, for Contract 465, for the construction of the Cannonsville dam, waste weir, and weir, waste, and outlet channels, and the completion of construction of the release water works, together with the plugging of the diversion conduit, construction of a gaging weir, access road and final grading in the vicinity of the dam, installation of equipment and other appurtenant work, all as set forth in the specifications. The Cannonsville dam will be approximately 2,800 feet in length along the top, will have a maximum height of about 175 feet, and will be constructed of earth compacted by rolling. The work is located near the Village of Deposit, Delaware county, New York.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1312, at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Engineer at the above address.

ARTHUR C. FORD, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: June 15, 1960

Narrows Bridge—Contract NB-4

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Wednesday, June 15, 1960

For Narrows Bridge Contract No. NB-4, Furnishing and Delivering Metalwork for Cable Anchorages. The work includes cable anchor bars, structural framing and cable saddle castings. The bid must be accompanied by a deposit in the amount of $150,000.

Plans, specifications and contract documents may be purchased at the office of the Authority for $20.00, which will not be refunded.

District of Columbia—Highway Construction—Dept. of Hwys. & Traffic, D. C., May 11, 1960. "K" ST. EXPRESSWAY, 20th ST. TO 25TH ST., N.W., FEDERAL AID PROJECT NO. U-34(5), Invitation No. C-60157-H, consisting approx. 2,000 cu. yds. wall concrete, 355 cu. yds. superstructure concrete, 4,050 cu. yds. tunnel concrete, 1,440,000 lbs. reinforcing steel, 2,650 cu. ft. Class A stone masonry, 18,730 cu. ft. Class B stone masonry, 354,000 lbs. Structural carbon steel (wage rates have been predetermined by the Labor Dept.) "Pre-bid meeting will be held to answer questions bidders may have on this project on June 1, 1960, 2:00 PM, Eastern Daylight Time, Rm. 500, District Building, 14th and E St., N.W., Washington, D. C." Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Rm. 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EDT, June 8, 1960, in Rm. 424, 499 Pa. Ave., N.W.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division,
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Bids: June 2, 1960.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., advanced standard time, which is nine-thirty o'clock A. M., eastern standard time, on the 2nd day of JUNE 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1; G. L. NICKERSON; District Engineer, 353 Broadway, Albany 1, New York						
Albany (Rte. 5)	R.C. 60-65	Albany-Schenectady, Pt. 1, S.H. 176 Albany-Schenectady, Pt. 2, S.H. 385	6.86	Asph. Conc.=3.00 Mi. Subsealing Exist. Pavt.=3.86 Mi.	$12,000 Plans $5	$217,000
DISTRICT No. 3, E. E. TOWLSON, District Engineer, 333 E. Washington Street, Syracuse, New York						
Onondaga (Rte. 5)	R.C. 60-51	Elbridge-Camillus, Pt. 2, S.H. 5143	4.00	Asph. Conc. Type 1A	$13,000 Plans $5	230,000
Tompkins (Rte. 34)	R.C. 60-78	Ithaca-West Danby, Pt. 1, S.H. 5379 Ithaca-West Danby, Pt. 2, S. H. 5567 Spencer-West Danby, Pts. 1 & 2, S.H. 8155	8.69	Asph. Conc. Type 1A	$25,000 Plans $5	438,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Livingston (Rte. 408)	FARC 60-63	Portage-Mt. Morris, Pt. 2, S.H. 5271 Portage-Mt. Morris, Pt. 3, S.H. 5270 Project F-557(10)	9.59	Asph. Conc.=9.53 Mi. Misc. Work=0.06 Mi.	$36,000 Plans $5	642,000
Monroe (Rte. 252)	FARC 60-60	Ballantyne Bridge-Pittsford Pt. 1, S.H. 8443 Ballantyne Bridge-Pittsford Pt. 2B, S.H. 8423 Project F-600(8)	5.95	Asph. Conc.=5.93 Mi. Misc. Work=0.02 Mi.	$22,000 Plans $5	393,000
Monroe (Rte. 261)	FARC 60-57	West Greece-Manitou Beach, S.H. 1281 Project F-508(9); S-584(1)	5.81	Asph. Conc.=5.77 Mi. Misc. Work=0.04 Mi.	$20,000 Plans $5	352,000
Wyoming (Rte. 39)	R.C. 60-68	Castile Village, S.H. 1088; Castile-Castile Center, S.H. 892; Castile Center-Perry Center, S.H. 854	6.20	Asphalt Concrete	$19,000 Plans $5	339,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus (Rte. 17)	R.C. 60-76	Vandalia-Carrollton, S.H. 5430	2.12	Asph. Conc.=2.08 Mi. Misc. Work=0.04 Mi.	$16,000 Plans $5	298,000
Niagara (Rte. 31)	FARC 60-72	Sanborn-Pekin, S.H. 740; Sanborn-Lockport, S.H. 9094; Shawnee-Cambria, S.H. 729 Project F-709(8)	5.49	Asph. Conc.=5.46 Mi. Misc. Work=0.03 Mi.	$35,000 Plans $5	634,000
Niagara (Rte. 31)	FARC 60-77	Wendts Corners-Gasport, S.H. 8451 Project S-672(2)	3.00	Asphalt Concrete	$26,000 Plans $5	464,000
DISTRICT No. 6, WM. J. DENNIS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 53)	R.C. 60-82	Prattsburg-Naples, Pt. 1, S.H. 8296 Prattsburg-Naples, Pt. 2, S.H. 8326	5.87	Asphalt Concrete	$25,000 Plans $5	438,000
DISTRICT No. 7; R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
St. Lawrence (Rte. 56)	R.C. 60-81	Potsdam-Norwood, S.H. 1032	5.37	Asphalt Concrete, Type 1A	$10,000 Plans $5	188,000
Clinton	FASSRC 60-5	Ellenburg-Irona, C.R. 55 (FAS-SS 40-11) Project S-167(4)	6.41	Asph. Conc. Type 1A	$10,000 Plans $5	183,000
Jefferson (Rte. 11)	FARC 60-64	Watertown-Philadelphia, Pt. 1, S.H. 5651 Project F-206(7)	1.35	Asph. Conc. Type 1A	$3,000 Plans $5	55,000
Lewis	FASSRC 60-6	Indian River-Remington Corners, CR 11 (FASS 51-4) Project S-337(3)	10.67	Asph. Conc. Type 1A	$19,000 Plans $5	319,000
DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Sullivan (Rte. 52)	R.C. 60-79	Stone Bridge-Falls Mills, S.H. 824 Jeffersonville-Kenoza Lake-Fosterdale, S.H. 795	5.78	Asphalt Concrete	$12,000 Plans $5	221,000
Broome (Rte. 79)	R.C. 60-71	Harpursville-Ouaquaga, S.H. 1106 Harpursville, S.H. 210; Center Village, S.H. 211	4.79	Asphalt Concrete	$10,000 Plans $5	183,000
Chenango (Rte. 41)	R.C. 60-74	Cincinnatus Lake-Long Pond, S.H. 8071 Long Pond-Smithville Flats, S.H. 5260	4.01	Asphalt Concrete	$10,000 Plans $5	181,000
Delaware (Rte. 8)	R.C. 60-61	Deposit-Masonville, S.H. 1888	5.06	Asphalt Concrete	$12,000 Plans $5	213,000
Delaware (Rte. 10)	R.C. 60-75	Bloomville-Hobart, Pt. 2, S.H. 8118	6.60	Asphalt Concrete	$15,000 Plans $5	279,000
Delaware (Rte. 10)	R.C. 60-73	Rockrift-Colchester, S.H. 1271	6.46	Asphalt Concrete	$14,000 Plans $5	247,000
Otsego (Rte. 205)	R.C. 60-69	West Oneonta-Hartwick, Pt. 2, S.H. 8387	5.84	Asphalt Concrete	$13,000 Plans $5	230,000
Schoharie (Rte. 30)	R.C. 60-67	Grand Gorge-Breakabeen, Pt. 2, S.H. 8312 Grand-Gorge-Breakabeen, Pt. 3, S.H. 8270	4.57	Asphalt Concrete	$10,000 Plans $5	176,000
Schoharie (Rte. 30)	R.C. 60-80	Grand Gorge-Breakabeen, Pt. 3, S.H. 8270 Grand Gorge-Breakabeen, Pt. 4, S.H. 8070	4.57	Asphalt Concrete	$10,000 Plans $5	178,000
Sullivan (Rte. 17B)	R.C. 60-70	Falls Mills-Callicoon, S.H. 823	4.80	Asphalt Concrete	$10,000 Plans $5	184,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: June 20, 1960

Construction of a Trunk Sewer and Two Pumping Stations

NOTICE OF LETTING
NEW CASTLE COUNTY, DELAWARE

SEALED PROPOSALS—Addressed to the President of the Levy Court of New Castle County, will be received by the County Engineer from qualified bidders, until 2:00 p.m., Eastern Daylight Saving Time, Monday, June 20, 1960, at the County Engineer's Office, Room 202, County Engineering Building, Kirkwood Highway (Mailing Address: Box 165, Wilmington, Delaware). All bids received in time will be opened and read in the Hearing Room on the said day and interested parties may attend.

The work consists of the construction of a trunk sewer and two pumping stations and has been divided into four contracts, as follows:

CONTRACT 1960-4—The Meadow Road Pumping Station. The work embraces the construction of the Meadow Road Pumping Station and appurtenances and approximately 330 linear feet of 30-inch diameter gravity sewer.

CONTRACT 1960-5—South Christina Interceptor, Sections 4 and 5. The work embraces the construction of a sanitary interceptor sewer 30 inches in diameter. The total length of sewer is approximately 16,750 linear feet.

CONTRACT 1960-6—Christina Pumping Station. The work embraces the construction of the Christina Pumping Station and appurtenances and approximately 130 linear feet of 30-inch gravity sewer.

CONTRACT 1960-7—South Christina Interceptor, Section 6. The work embraces the construction of a sanitary interceptor sewer of 30 inches and 24 inches in diameter. The total length of the sewer is approximately 13,200 linear feet.

Bidders may bid on one or more contracts. The bids on each contract will be considered independently of the other contracts.

Each bid will be accompanied by a certified check or surety bond in the amount of ten percent (10%) of the total bid.

Plans and specifications may be obtained at the New Castle County Engineering Building, Room 103, Kirkwood Highway, New Castle County, Delaware (Mailing Address: Box 165, Wilmington, Delaware), or at the office of Whitman, Requardt & Associates, 1304 St. Paul Street, Baltimore 2, Maryland, on and after May 27, 1960. The fee for each set of plans and specifications is Ten Dollars ($10.00), which is not refunded.

The Levy Court reserves the right to reject any or all bids received and to waive any informalities in the bids received.

JOHN TAYLOR
COUNTY ENGINEER

CONTRACTORS
WATCH
THIS SECTION
for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

Bids: July 12, 1960

Notice for Proposal of Natural Gas Franchise

Proposals for an exclusive natural gas franchise will be accepted in the office of the City Clerk of the City of Wilton Manors, Florida, 524 N. E. 21st Court, Wilton Manors, Fort Lauderdale, Florida, until 8:00 o'clock P. M. on Tuesday, July 12, 1960.

Bids: July 19, 1960

The Construction of A Water Treatment Plant and Two Pumping Stations

FOR THE BOARD OF
COUNTY ROAD COMMISSIONERS OF
THE COUNTY OF WAYNE, MICHIGAN
IN THE CITY OF ALLEN PARK

Sealed proposals will be received by the undersigned in Room 726 on the 7th Floor, City-County Building, Woodward and Jefferson Avenue, Detroit, Michigan, until 1:30 P.M., Eastern Standard Time, Tuesday, July 19, 1960, at which time and place all bids will be publicly opened and read aloud for Project No. W-143C-4, described as follows:

Included in the work is the construction of foundations, substructures and superstructures for the Low Lift Building, High Lift Building, Filter Building, Chemical Building, Flocculating and Settling Basins, Filtered Water Reservoirs, Clarifiers, all connecting conduits, distribution headers to the extent shown and all appurtenant structures.

The Low Lift and High Lift Buildings are combined with an area approximately 112 ft. by 450 ft. in plan. They are pile supported, rigid structural steel frame, reinforced concrete substructure walls and floors, masonry and precast concrete lift slab superstructure walls and precast concrete roof deck. The Low Lift area is built over and in conjunction with an existing caisson, 65 ft. in diameter.

The Filter Building, approximately 235 ft. by 300 ft. in plan, will have 20 rapid sand filter units each with an effective area of approximately 2,100 sq. ft. It is soil supported and has reinforced concrete frame slabs and walls, precast, pre-tensioned, concrete girders, precast concrete roof deck.

The Chemical Building, approximately 235 ft. by 130 ft. in plan, is pile supported and has structural steel frame, reinforced concrete substructure, walls and slabs, masonry superstructure walls and partitions and metal roof deck.

The Flocculating and Settling Basins and connecting conduits, are soil supported, reinforced concrete structures, throughout. Their combined area in plan is approximately 680 ft. by 592 ft.

The Filtered Water Reservoirs consist of three (3) ten million gallon steel tanks, approximately 330 ft. in diameter. There are two (2) Clarifiers of reinforced concrete construction, approximately 150 ft. in diameter, complete with mechanical equipment. Connecting piping and distribution piping is reinforced concrete water pipe (steel cylinder pipe—not prestressed), poured concrete flume and steel pipe.

The work also includes the furnishing and installation of pumps, sluice gates, wash water troughs, filter underdrain system, drain lines, chemical feed equipment, piping, valves and fittings, instrumentation and control equipment, complete heating, ventilating, air conditioning, dehumidification, plumbing, boilers, and miscellaneous piping systems, electrical power and lighting.

Also included is all rough and finish grading, paving, storm and sanitary sewers, temporary waste treatment facilities, foundation underdrains, railroad bridge and track construction, flumes, transmission mains and vaults.

Plans, specifications, and proposal blanks may be secured by prospective bidders upon application in Room 726 on the 7th Floor, City-County Building, Woodward and Jefferson Avenues, Detroit, Michigan. A fee of One Hundred Dollars ($100.00) will be charged for each set of plans and proposal blanks furnished to the bidders, which will be refunded to those bidders who submit a bona fide bid to the Board and return the plans within fifteen (15) days after the time set for opening of bids.

Each sealed bid shall be accompanied by a bid guaranty, made payable to the Board of County Road Commissioners of the County of Wayne, Michigan, consisting of a certified or cashier's chceck in the amount of One Hundred Fifty Thousand Dollars ($150,000.00) and a bid bond executed by the bidder and a corporate surety licensed to do business in the State of Michigan, in the amount of One Million Dollars ($1,000,000.00).

Proposals which have been submitted shall not be withdrawn after the time set for the opening of bids.

The Board reserves the right to reject any or all bids, to waive any informalities in bids, and to accept the bid that, in the opinion of the Board, is to the best interests of the Board and of the County of Wayne, Michigan.

Board of County Road Commissioners
of the County of Wayne, Michigan
Charles L. Wilson, Chairman
Michael J. O'Brien, Vice-Chairman
William E. Kreger, Commissioner

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5343) will be received at Fargo, North Dakota, until 10 a.m., Central Standard Time, June 28, 1960, for furnishing labor and materials for Garrison-Minot-Rugby 115-Kilovolt Transmission Line, Transmission Division, North Dakota, Missouri River Basin Project. Location in Mercer, McLean, Ward, McHenry and Pierce Counties, North Dakota. Principal items are 893 structures—Furnishing and constructing structures of various types and maximum pole lengths; 115.44 miles of line—Furnishing and stringing ACSR conductors of various sizes; 691,000 pounds—Furnishing and erecting steel towers; and other work. Completion time 450 days. For particulars, address Bureau of Reclamation, P. O. Box 2553, Billings, Montana; P. O. Box 1993, Fargo, North Dakota; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5341) will be received at Denver, Colorado, until 2 p.m., Mountain Standard Time, June 21, 1960, for furnishing twenty-four (24), 12-foot 5-inch by 15-foot 11⅝-inch bulkhead gates, with seats, guides and lifting frame for Glen Canyon Powerplant, Colorado River Storage Project, Arizona-Utah. Delivery is desired within 240 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Department of Commerce, Bureau of Public Roads, May 17, 1960. SEALED BIDS will be received at the office of J. L. Obenschain, Division Engineer, Bureau of Public Roads, Gatlinburg, Tennessee, until 11:00 a.m., E.S.T., JUNE 16, 1960, for Project 8G2, Foothills Parkway, Blount County, Tennessee. Grading, Draining, Crushed Aggregate Base, Bituminous Surface Treatment, Box Culvert Overpass, and other work from Murray Gap northeasterly for 3.874 miles. The approximate quantities of the more important items are 278,200 cu. yd. Excavation, 26,000 tons Crushed Aggregate Base, and 390 cu. yd. Concrete. Minimum wage rates have been fixed as required by law. Plans, specifications and bid forms are available upon request at the address given above or Bureau of Public Roads, 1440 Columbia Pike, Arlington 4, Virginia. F. W. Cron, Regional Engineer.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5344) will be received at Farmington, New Mexico, until 10 a.m., Mountain Standard Time, June 21, 1960, for furnishing labor and materials for earthwork and structures Main Canal Station 44+50 to Station 355+00, Hammond Participating Project, Colorado River Storage Project, New Mexico. Location near Farmington, New Mexico. Principal items are 327,700 cu. yds. excavation; 4,294 lin. ft.,—furnishing and laying concrete pressure pipe of various symbols; 785 lin. ft.,—furnishing and laying concrete culvert pipe of various sizes; and other work. Completion time 360 days. For particulars, address Bureau of Reclamation, P. O. Box 360, Salt Lake City 10, Utah; P. O. Box 2028, Farmington, New Mexico; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids for building Modernization, Air-conditioning, etc. at the U.S.P.O., New Rochelle, N. Y. Project No. 00823 will be received until 2:00 P.M., EDST June 20, 1960; and then publicly opened. Bidding material may be obtained from the Business Service Center, General Services Administration, 250 Hudson Street, New York 13, N. Y., or from the Custodian of the Building where the work is to be done.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

JUNE 9TH
ISSUE
CLOSES
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★ ★

SOUTH AMERICA
CIVIL ENGINEER

Subsidiary of major oil company operating in western Venezuela has opening for a qualified Civil Engineer.

MINIMUM REQUIREMENTS:

- . . . Degree in civil or architectural engineering.
- . . . Plus at least 3 years experience in general construction activities including overall design work with emphasis on reenforced concrete.
- . . . Field inspection experience and knowledge of Spanish desirable.
- . . . Age to 35 Years.

Liberal salary—Plus Allowances, bonus and other benefits.

Qualified candidates submit detailed experienced summary and personal data to:

P-4441, Engineering News-Record,
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

★ ★

ADDRESS BOX NO. REPLIES TO: Box No.
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Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Civil Engineer with municipal experience. Able to register as a Civil Engineer in State of Ohio. Send complete resume of experience and qualifications to P-4320, Engineering News-Record.

Chief Sewer Engineer. Fort Wayne, Indiana. Population—approximately 155,000. Must be or immediately become registered in the State of Indiana as a Professional Engineer. Degree in Civil Engineering or equivalent experience, plus a record of progressively responsible supervisory experience in the design, construction and operation of sewer systems. Salary range: $8000 to $9500. Send complete resume to: Chief Engineer, City Utilities, 425 So. Calhoun Street, Fort Wayne, Indiana.

Estimator—Expanding Philadelphia Contractor has an opening for man thoroughly experienced in competitive public bidding. Top pay and working conditions. Wingate Construction Company, 34 So. 17th Street, Phila., 3, Penna.

Specifications Writer. Permanent position available immediately with established Midwestern consulting firm. Architectural or civil engineering degree preferred. Moving expenses paid. 3-week vacation. Salary commensurate with ability. Write P-4413, Engineering News-Record.

Detailer & Checker Structural Steel. We require an experienced man between the ages of 30 and 45 years for permanent position in our Drafting Room. Hospitalization and retirement benefits. Give references, age, and salary expected in application. Barber & Ross Company, 2323-4th Street, N. E., Washington 2, D. C.

Civil Engineer—Registered Professional Engineer capable of performing engineering and administrative duties required of City Engineer. Salary open. Send resume of educational and work experience background and salary requirements to City Manager's Office, City of Marysville, Michigan.

• POSITIONS VACANT

Teaching and Research Assistantships are available to qualified students while working for M. S. or PH.D. degree in either solid or fluid mechanics. Write, Chairman, Dept. of Engineering Mechanics, University of Kansas, Lawrence, Kansas.

Construction Engineer, graduate. Heavy industrial construction in Chicago area. Work involves field engineering, production accounting, contracting, estimating and dealing with customers. P-4393, Engineering News-Record.

Wanted—Young, aggressive and competent Civil Engineers, Instrumentmen and Draftsmen for work in Mid-West. Contact Western Contracting Corporation, Sioux City, Iowa.

Junior Estimator familiar with blueprint reading and take-off. Send written resume to Blake Construction Company, Suite 1100, 1120 Connecticut Avenue, N. W., Washington 6, D. C.

Engineer, ME, ChE, IE—To take charge of ind. food plant maint. dept. & equipt. purch, set-up & Installation. Varied exp. needed. Leadership A Must. Sal. based on exp. & potential. Exlt. future with growing Queens, N. Y. organization. P-4472, Engineering News-Record.

• SELLING OPPORTUNITY AVAILABLE

Sales Engineer—Fast growing concern needs two graduate engineers, or equivalent construction experience, with sales ability. Permanent positions in South Central United States. Some travel required. Pilot's license definite advantage. Age 28-35. Unusually good opportunity. Submit resume to SW-4432, Engineering News-Record.

• POSITIONS WANTED

Mech. Engr., married, age 38, 12 years experience, refrigeration, air conditioning, heating, plumbing, distribution systems, 3½ years working overseas on military projects. Desires overseas employment. PW-4383, Engineering News-Record.

Controller — Office Manager, etc. salary 190.00 per week—consider overseas. PW-4434, Engineering News-Record.

ARCHITECTURAL REPRESENTATIVE

Experienced Manufacturer's Representative, calling on leading Architects and Engineers in New York and New England seeks opportunity to develop specification business for top level Manufacturer of Building or Construction Materials.

RA-4405, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• POSITIONS WANTED

Project Manager, construction supervision, Contract Administration. 22 yrs. exp. hvy. constr. major projects U.S. & O.S. PW-4373, Engineering News-Record.

Chief and Administrative Engineer, age 42, 10 years design and supervisory experience in consultant engineering. Graduate and registered professional engineer. PW-4415, Engineering News-Record.

Manufacturers Representative, 14 yrs. construction equipment experience. Will relocate. PW-4408, Engineering News-Record.

Graduate C. E., age 26, EIT Texas, Comm'ssioned officer, Civil Engr. Corps, USNR. Experience in public works and construction with the Seabees. Desire employment in maintenance and construction in the Southwest. PW-4328, Engineering News-Record.

Controller, B.S. in business, age 35—10 yrs. exp. light & heavy const. including Costs, Budgets, Gov. Claims. Bid Procedures, Office Mgr. PW-4302, Engineering News-Record.

Office Manager-Accountant — Experienced heavy construction. Field office or central office NCR machine accounting. Mid-west or West USA. Available. PW-4294, Engineering News-Record.

Secretary—15½ years construction experience. Know secretarial field and some accounting. Desire Southwest or West Coast. Available 30 days. PW-4322, Engineering News-Record.

(Continued on page 108)

"Put Yourself in the
Other Fellow's Place"

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TO EMPLOYEES

Letters written offering Employment or applying for same are written with the hope of satisfying a current need. An answer, regardless of whether it is favorable or not, is usually expected.

MR. EMPLOYER, won't you remove the mystery about the status of an employee's application by acknowledging all applicants and not just the promising candidates.

MR. EMPLOYEE you, too, can help by acknowledging applications and job offers. This would encourage more companies to answer position wanted ads in this section.

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This section will be the more useful to all as a result of this consideration.

Classified Advertising Division

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330 West 42nd St., New York 36, N. Y.

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Graduate civil or architectural engineer will find challenging opportunity in office position at headquarters of expanding concrete products division of successful major company. Will assist with analysis and design of various types of concrete pipes, development of specifications, preparation of standards, estimating, etc. Prefer under age 30 with office engineering experience, including some drafting and field work. For further information, please send detailed resume to:

Personnel Manager
AMERICAN-MARIETTA COMPANY
101 East Ontario
Chicago 11, Illinois

SALES ENGINEER

One of our progressive, expanding divisions has an excellent opening in the Chicago area for a man qualified to sell clamshell buckets and grapples.

This division manufactures an extensive line of buckets and grapples for the steel industry, industrial and contracting business.

Qualifications: Prefer M.E. degree with sales experience along these lines. Craneway, crawler, overhead and locomotive type crane experience will be given consideration.

Compensation: Salary—plus expenses—plus fringe benefits to include insurance, pension, savings and vacation. Send complete qualifications and salary desired to

BLAW-KNOX COMPANY
300 Sixth Avenue, Pittsburgh 22, Pa.
J. J. Zimmerman

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G. VICTOR HOPKINS

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

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ELECTRICAL and MECHANICAL

Graduate Engineers needed for AEC Project in Nebraska. Positions require substantial experience in industrial installations. Duties include estimating and office engineering. Submit complete resume of experience, qualifications and approximate salary range.

PETER KIEWIT SONS', INC.
P. O. Box 926 Lincoln, Nebraska

EMPLOYMENT PROBLEM?

When you are in need of specialized men for specialized jobs, contact them through an employment ad in this publication.

MECHANICAL ENGINEERS

Experienced In Utilities Design? Want To Live In Florida?

The Chemstrand Corporation—an expanding, multi-plant major producer of synthetic fibers—is seeking the following for interesting professional assignments to a utilities design group at PENSACOLA, FLORIDA:

MECHANICAL ENGINEER

Bachelor's Degree with a major in Power Generation and Distribution and in minimum of 5 to 10 years experience in engineering design, construction, and operation of steam power generation and distribution systems as well as air conditioning, water treatment, and waste disposal systems. Petroleum or petrochemical industry background helpful.

MECHANICAL ENGINEERS (3)

Academic training and experience similar to above requirements but with three to five years of industrial background.

These assignments involve selection of equipment, preparation of specifications and drawings required for procurement and erection of utilities generation and distribution systems and engineering studies of utilities areas for new plants and/or expansion of present plants.

PENSACOLA—on Florida's sunny gulf coast—is a modern metropolitan community with a mild climate, a variety of recreational opportunities and attractive family living.

Interested? Send resume including salary information to:

Manager,
Employment
Recruitment

The Chemstrand Corporation
Box ED-6B, Decatur, Alabama

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PROJECT MANAGERS:

Graduate Civil Engineers Preferred.

SUPERINTENDENTS,

Minimum 10 years experience in heavy construction projects. EXCAVATION, HIGHWAYS, RAILROADS, DAMS, DOCKS, AIRPORTS. Please submit detailed resume.

P-4440, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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BUSINESS PARTNER as EXECUTIVE Vice-President and General Manager

Consulting Engineering and General Contracting Group

World Wide Contacts
Foreign and Domestic Projects

Sales experience Essential

Minimum investment $50,000.00

Annual income should equal investment
Send complete resume first letter

P-4350—Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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Graduate civil engineer with experience in wood form work and shoring of concrete structures. Wisconsin professional engineer preferred. Rex Spanall Inc. (Subsidiary Chain Belt Company). Write Chain Belt Company, 4501 West Greenfield Ave., Milwaukee 1, Wisconsin, for further information.

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With heavy experience background in dams, tunnels and hydroelectric projects. Work domestic or foreign. Salary commensurate with experience. Write:

P-3097, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

EMPLOYMENT OPPORTUNITIES

• POSITIONS WANTED

(Continued from page 106)

Field-office engr. layout, supervision, take off, etc. municipal, bldg. and heavy const. large or small firms, single. Location open. E. Brown, 600 N. 71st Ave., W. Hollywood, Fla.

Graduate Civil Engineer with five years of experience seeks position in Puerto Rico. Resume on request. PW-4357, Engineering News-Record.

Graduate Civil Engineer, 31, Married, 6 Years Construction Experience, U. S. Citizen, Fluent Spanish, Registered in Colombia, will consider U. S. or Foreign employment. PW-4460, Engineering News-Record.

Construction Manager, BSCE and 2 years M.E. Thoroughly capable, 20 years experience on various type projects. Best of references. Presently employed, desire change. Now have unclassified G. C. license in N. C., will work anywhere in U. S. PW-4464, Engineering News-Record.

Electrical Supt. or Chief Electrician age 59. 40 years experience, Construction Maintenance, Starting Salary $200.00 per week. Excellent References, Resume on Request. PW-4471, Engineering News-Record.

Construction Superintendent B.S.C.E. Exp. Mgr., Chf. Eng., Hvy. Const. Roads, Flood Control, Tunnels, Bldgs., Govt. Contracts, will Relocate, 3419 Utah, St. Louis, No., Eiswirth.

Structural Steel Fabrication Manager 10 years experience, estimating, selling, supervising. Production of 2 million per year. Business BSCE and 2 years M.E. Best of references. Excellent varied experience. Presently employed, desire change. Will relocate anywhere in U. S. PW-4463, Engineering News-Record.

Project Manager or Engineer. California Registered P.E. M.S. in Structural Engineering. Fellow-ASCE. 28 years experience in construction, design and administration of highways, bridges and storm drains. Administration of multimillion dollar complex interchanges for past ten years. Can handle projects from preliminary design to completed construction. Desires foreign work. PW-4483, Engineering News-Record.

Executive 15 yrs exp every phase of the business, field & office, legal-const background, mgr, atty, administrator, troubleshooter. PW-4473, Engineering News-Record.

Construction Superintendent, 32, seeks position with midwest firm. Minimum $13,000. PW-4458, Engineering News-Record.

Graduate Civil Engineer with 13 years varried construction experience. Six years as chief estimator responsible for purchasing, expediting & contract negotiation. Desires position with general contractor offering opportunity for advancement. Prefer Mid. West. PW-4468, Engineering News-Record.

Construction and Industrial Salesman desires sales position with leading manufacturer—Eight years experience—College Graduate—Married—Will Relocate. PW-4453, Engineering News-Record.

Engineer, steel fabrication executive, age 38, capable manager for structural and/or ornamental shop. Thoroughly experienced. Detailing, estimating, selling, purchasing. Can deal profitably with contractors, architects, etc. Desires responsible permanent position with reputable fabricator. Available July. PW-4459, Engineering News-Record.

Traffic Engineer, BSCE, Graduate Yale Bureau of Highway Traffic, 5 years experience, ambitious. Imaginative, presently assist. T.E. of an eastern state; seeks a responsible change. Canada or USA. PW-4469, Engineering News-Record.

Sales Engineer. Welding, Steel Erection, Direct Sales, Sales Systems, Estimating Administrative—5 yrs experience—Age 35. NYC area only. PW-4478, Engineering News-Record.

Project Coordinator & Eng'r'g procurement— 15 yrs experience stateside & overseas. Utilities, transmission, heavy construction, government projects, chemical & refineries. Subcontract negotiation, estimating, material & quality control, ware housing. Capable of setting up or reorganizing department. Grad. Eng. Relocate or overseas. PW-4474, Engineering News-Record.

Construction Supt. General Construction. PW-4482, Engineering News-Record.

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Send to office nearest you.
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CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• CONTRACT WORK WANTED

Structural, Mechanical, Electrical—15-man group of licensed engineers (4), designers and draftsmen for all types of structures, heating, air conditioning, steam, water and process piping, power wiring and lighting. Immediately available. CWW-4382, Engineering News-Record.

• BUSINESS OPPORTUNITY

Mature engineer, 20 yrs. exp., desires responsible associate to form consulting office in Texas Gulf Coast area covering Civil, Industrial, Sanitary fields. Would consider association with established firm. Please include experience and references with reply. BO-4480, Engineering News-Record.

• WANTED

Anything within reason that is wanted in the field served by Engineering News-Record can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

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BO-4439, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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15W Bucyrus-Erie Dragline, 14 yd.
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4161 Marion 6 yd. Elec. Shovel
2400 Lima 6 yd. Std. & H.L. Shovels
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Editorials

Sweetness and Light

For U. S. business as a whole the first quarter of 1960 did not produce the vigorous expansion that businessmen had expected.

But for the U. S. construction industry there was ample evidence of expansion; things had seldom looked brighter, at least statistically, and the statistics augured well for the year. April was a booming month in which constructors racked up $500 million worth of new work each week as the market for heavy construction brightened in nearly all major categories—highways, bridges, industrial and commercial buildings, pipelines, waterworks (ENR May 5, p. 21).

Not all is sweetness and light, of course. It never can be. The volume of construction is one thing, but profits, sad to say, are another. The competitive situation has been, and remains, fierce. The profitless prosperity that has plagued the industry still plagues even the largest of contractors in it. And the smaller, less stable, continue to die off at a frightening failure rate (see below).

For construction, nevertheless, with a big five months behind it in '60, there is reason for business optimism: Volume is high and will go higher. But the old joke about the fellow who doubled his volume to make money while selling each item at a loss was never less funny. For construction, even the booming figures can turn sour if contractors don't sell their services at a profit.

Advice Against Failure

Business failures among contractors are running nearly 20% ahead of last year, according to the Dun & Bradstreet tally (ENR May 19, p. 181). The reason for such an increase cannot be pinpointed accurately, but the reasons why large numbers of contractors fail each year have been examined many times. They include lack of experience, bad luck, inadequate working capital, poor estimating, too little equipment or too much unpaid-for equipment, slipshod accounting and over-all bad management.

Many of the contractors who fail each year are newcomers who shouldn't have been in the construction business at all. But "good" contractors fail, too, and it is they who can profit from the warnings voiced periodically by authoritative persons.

One of the best sets of "do's and don'ts" to come along recently is the advice offered to the Associated General Contractors convention by Robert L. Gordon, vice president of the Bank of America National Trust & Savings Association, Los Angeles. Among the "do's and don'ts":

Don't take on more work than you can properly finance. If unsecured loans far outrun your "true working capital," your banker will become your senior partner, which doesn't make sense.

Don't saddle yourself with too large time payments on equipment. It may cause you to bid too tight in order to keep cash flowing in to make the payments.

Don't skimp on good accounting. It pays for you and your banker to know the state of your business.

Don't count profits earned on uncompleted jobs as working capital or a part of net worth. Future costs may cause such profits to disappear.

Do forecast cash-flow in and out and profit or loss on each job.

Do ask for and collect receivables when they are due.

Do discuss your financial needs with your banker before bidding a job. If a situation looks sour enough for the banker to stay out of, probably you should, too.

This is the kind of advice that should color every contractor's thinking. It reflects a creed that successful contractors have followed. And if other contractors have failed despite every possible attention to good business practices, that does not depreciate the advice. Following it would reduce the chance of failure, and that is decidedly a plus.

Two Z's Please

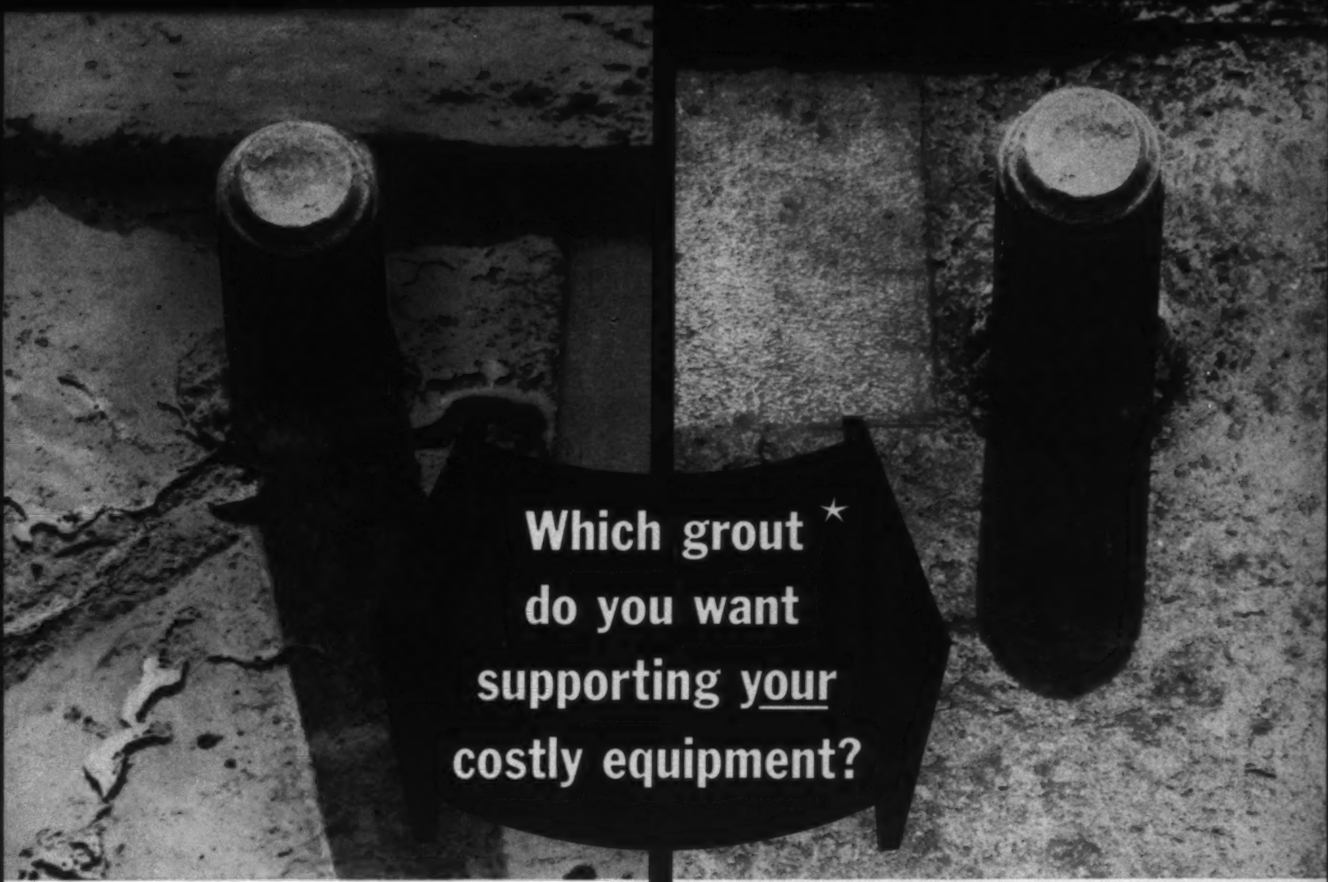
It seems to be sticking—that unfortunate official name for the world's longest span. The great suspension bridge over The Narrows, entrance to the Port of New York is, sadly, consistently being called the Verrazzano-Narrows Bridge.

Repeating our expressed respect for the memory of Giavanni da Verrazzano (ENR Aug. 20, 1959, p. 132), who explored these waters in 1525, we still think his name is a poor prefix for the structure that has been called the Narrows Bridge for all the years that it has been planned and discussed. Moreover, it is quite likely that more people from coast to coast, let alone locally, could tell you where the Narrows Bridge is to be built than could tell you who Giavanni da Verrazzano was.

The great Narrows Bridge will be the giant of them all with its double-deck structure spanning 4,660 ft. Freedom Bridge? Liberty Bridge? Freedom's Gate? Perhaps such labels as these could be justified for the span that will frame the Statue of Liberty and the New York skyline for approaching visitors from abroad. But it's bewildering how the powers-that-name-bridges could use the nation's greatest structure of its kind to commemorate the name of an erstwhile visitor from abroad whom practically nobody remembers.

So far-fetched is use of this little-known explorer's name that establishment of its spelling has taken a ruling by a local historical authority: Two Z's, not the single Z that has appeared on official signs and documents. Two Z's it is: Verrazzano (ver-rah-TSAH-no) it is.

But pardon us, if we lapse into calling the $320-million project the Narrows Bridge now and again. It will be partly out of habit.



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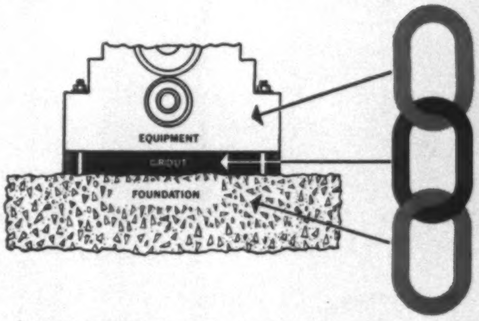

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